DRAFT

Environmental Impact Report/
Environmental Impact Statement/
Environmental Impact Statement

Upper Truckee River Restoration and Golf Course Reconfiguration Project

Volume II

Chapters 3 through 9

SCH# 2006082150

Lead Agencies:

California State Parks

Lake Tahoe Environmental Improvement Program

Bureau of Reclamation

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California State Parks	Lake Tahoe Environmental Improvement Program	Bureau of Reclamation
P.O. Box 16 Tahoe City, CA 96145	P.O. Box 5310 Stateline, NV 89449	2800 Cottage Way, Room E-2606 Sacramento, CA 95825
Attn: Cyndie Walck CEQA Coordinator (530) 581-0925	Attn: Mike Elam TRPA Project Manager (775) 588-4547	Attn: Myrnie Mayville NEPA Coordinator (916) 978-5037

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Organized by environmental resource category, Chapter 3, "Affected Environment and Environmental Consequences," provides an integrated discussion of the affected environment including regulatory and environmental settings and environmental consequences including impacts and mitigation measures to reduce or avoid potentially significant impacts associated with implementation of the alternatives. Section 3.16 discusses cumulative impacts and mitigation measures for all resource areas. The project's relationship to Tahoe Regional Planning Agency (TRPA) environmental carrying capacity thresholds is described in the Chapter 4, "Other Required Sections," Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS

3.1.1 CEQA, NEPA, AND TRPA REQUIREMENTS

As described previously in Chapter 2, this is a joint environmental document prepared to serve as an environmental impact report (EIR) under the California Environmental Quality Act (CEQA), environmental impact statement (EIS) under the National Environmental Policy Act (NEPA), and EIS under TRPA's Code of Ordinances and Rules of Procedure. The environmental analysis in Chapter 3 combines the requirements of each of these environmental laws, their relevant regulations, and in the TRPA case, ordinances and rules. Each set of provisions is very similar as to purpose and general content. Terminology and some details about document contents vary between the three sets of environmental requirements. This EIR/EIS/EIS contains elements to satisfy all three.

CEQA

The State CEQA Guidelines explain that an EIR must evaluate environmental impacts associated with the project and identify feasible mitigation for any potentially significant impacts. All phases of a proposed project, including development and operation, are evaluated in the analysis (State CEQA Guidelines Section 15126.2). The EIR must identify significant or potentially significant effects on the environment, which consist of substantial or potentially substantial adverse changes on the physical environment resulting from implementation of the project.

An EIR must also discuss inconsistencies between the proposed project and applicable local and regional plans (State CEQA Guidelines Section 15125[d]).

An EIR must describe any feasible measures that could minimize significant adverse impacts, and the measures are to be fully enforceable through permit conditions, agreements, or other legally binding instruments (State CEQA Guidelines Section 15126.4[a]). Mitigation measures are not required for effects that are found to be less than significant.

NEPA

If a Federal agency determines that a project would significantly affect the human environment, an EIS must be prepared. This does not preclude the identification of significant environmental effects in a NEPA EIS; however, environmental effects need to be discussed in terms of their context and intensity. In addition, while CEQA focuses on significant impacts of a proposed project, NEPA states that both beneficial and adverse impacts should be presented in an EIS. It is permissible for Federal and state lead agencies to use different thresholds for determining the need for mitigation.

Any major Federal action with the potential to cause environmental effects is subject to NEPA compliance. CEQ regulations (40 Code of Federal Regulations [CFR] 1507.3) require that Federal agencies "adopt procedures to ensure that decisions are made in accordance with the policies and purposes of the Act." It is the responsibility of the agencies to designate major decision points in their programs to ensure that NEPA process is in correspondence. Whenever Reclamation is considering an action, the NEPA process is integrated into the project planning and decision-making processes.

The CEQ regulations for implementing NEPA specify that a Federal agency preparing an EIS must consider the effects of the alternatives on the environment; these include effects on ecological, aesthetic, historical, cultural, and social resources, and economic and health effects. Environmental effects include direct, indirect, and cumulative effects (defined below in Sections 3.1.2 and 3.1.3). An EIS must also discuss possible conflicts with the objectives of Federal, State, regional, and local land use plans, policies, or controls for the area concerned; energy requirements and conservation potential; and urban quality, historic and cultural resources, and the design of the built environment. An EIS must identify relevant, reasonable mitigation measures that are not already included in the project alternatives that could avoid, minimize, rectify, reduce, eliminate or compensate for the project's adverse environmental effects. (40 CFR 1502.14, 1502.16, 1508.8.)

TRPA

TRPA Code of Ordinances states that an EIS shall identify significant environmental impacts of the proposed project, any significant adverse environmental effects which cannot be avoided should the project be implemented and mitigation measures which must be implemented to assure meeting standards of the Lake Tahoe Basin. In assessing the impact of a proposed project on the natural and social environment, the lead agency should evaluate the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity as well as any significant irreversible and irretrievable commitments of resources that would be involved if the proposed project was implemented. The EIS shall also evaluate growth-inducing impact of the proposed project (TRPA Code of Ordinances, Section 5.8.B).

The following discussions present the organization and general assumptions used in the environmental analysis contained in this EIR/EIS/EIS. The reader is referred to the individual technical sections regarding specific assumptions, methodology, and significance criteria used in the analysis.

3.1.2 Section Contents and Definition of Terms

The environmental setting, impacts, and mitigation measures have been prepared using NEPA terminology (affected environment, environmental consequences [generally], and mitigation measures). Chapter 3 is organized into the following environmental topic areas:

- Section 3.2, Land Use
- Section 3.3, Hydrology and Flooding
- Section 3.4, Geomorphology and Water Quality
- Section 3.5, Biological Resources (Fisheries and Aquatic Resources, Vegetation and Wildlife)
- Section 3.6, Earth Resources
- Section 3.7, Scenic Resources
- Section 3.8, Recreation
- Section 3.9, Cultural Resources
- Section 3.10, Transportation, Parking, and Circulation
- Section 3.11, Air Quality
- Section 3.12, Noise
- Section 3.13, Public Services and Utilities
- Section 3.14, Human Health and Risk of Upset
- Section 3.15, Population and Housing, Socioeconomics, and Environmental Justice
- Section 3.16, Cumulative Impacts

Sections 3.2 through 3.15 follow the same general format:

"**Affected Environment**" consists of two subsections: Regulatory Setting and Environmental Setting, which include the following information:

- **Regulatory Setting** identifies the plans, policies, laws, and regulations that are relevant to each resource area and describes permits and other approvals necessary to implement the project. As noted above, the EIR/EIS/EIS needs to address possible conflicts between alternatives and the objectives of Federal, State, regional, or local formally adopted land use plans, policies, or controls for the area. Therefore, this subsection summarizes or lists the potentially relevant policies and objectives, such as from the applicable Plan Area Statements and Lake Tahoe Regional Plan

- **Environmental Setting** provides an overview of the existing physical environmental conditions in the area that could be affected by implementation of the alternatives (i.e., the "affected environment") in accordance with State CEQA Guidelines Section 15125 and NEPA regulations (40 CFR 1502.15).

"**Environmental Consequences**" discusses the effects of the project on the environment, in accordance with State CEQA Guidelines Sections 15125 and 15143, NEPA regulations (40 CFR 1502.16) and Section 5.8.B(3) of TRPA's Code of Ordinances, which requires identification of significant unavoidable impacts and with Section 5.8.D of TRPA's Code of Ordinances, which calls for "required findings" in conjunction with the identification of significant unavoidable impacts. The following discussions are included in this subsection:

This section also provides mitigation measures to reduce potentially significant effects of the proposed project to the extent feasible. The mitigation measures are numbered to correspond with the impact addressed by the mitigation measure.

This section also describes whether mitigation measures would reduce project impacts to less-than-significant levels.

- **Methods and Assumptions** describes the methods, process, procedures, and/or assumptions used to formulate and conduct the impact analysis. Where relevant, this section may also include dialogue on any issue that is not discussed in the impacts section (i.e., where no impact would be expected and the reasoning behind this conclusion).

- **Significance Criteria** provides the criteria used in this document to define the level at which an impact would be considered significant in accordance with CEQA, NEPA, and TRPA Code of Ordinances. Significance criteria used in this EIR/EIS/EIS are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist, factual or scientific information and data; and regulatory standards of Federal, State, and local agencies. While CEQA requires a determination of impact significance for each impact discussed in an EIR based on significance criteria, NEPA does not require this for an EIS. Under NEPA, preparation of an EIS is triggered if a federal action has the potential to "significantly affect the quality of the human environment," which is based on the context and intensity for each potential impact. The significance thresholds used in this EIS/EIR also encompass the factors taken into account under NEPA to evaluate the context and the intensity of the effects of an action Effects on environmental threshold carrying capacities (thresholds) of the Tahoe Regional Planning Compact were evaluated. The project's effects on thresholds are described in Chapter 4, "Other Required Sections," Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

- **Project-Related Impacts** are listed numerically and sequentially throughout each section, for each alternative. Project impacts are numbered sequentially for Alternatives 1 through 5 in each section. For example, impacts in Section 3.3 are numbered 3.3-1(Alt. 1), 3.3-2(Alt. 1), and so on for Alternative 1 and impacts in Section 3.3 for Alternative 2 are numbered 3.3-1(Alt. 2), 3.3-2(Alt. 2), and so on. A **bold** font impact statement precedes the discussion of each impact and provides a summary of each impact and its level of significance. The discussion that follows the impact statement includes the analysis on which a conclusion is based regarding the level of impact. Impact conclusions are made using the significance criteria described above and include consideration of the “context” of the action and the “intensity” (severity) of its effects in accordance with NEPA guidance (40 CFR 1508.27).

The level of impact of the alternatives is determined by comparing estimated effects with baseline conditions. Under CEQA, the existing environmental setting (as defined above) normally represents baseline conditions against which impacts are compared to determine significance. Under NEPA, the No-Action Alternative (expected future conditions without the project) is the baseline against which the effects of alternatives are compared to determine the relative intensity of effects among the alternatives.

Alternative-specific analyses are conducted to evaluate each potential impact on the existing environment. This assessment also specifies why impacts are found to be significant, potentially significant, or less than significant, or why there is no environmental impact. Where after detailed analysis of available scientific information findings are too uncertain to reach an appropriate conclusion a conclusion of “too speculative” was made, only after thorough analysis. The State CEQA Guidelines Section 15145 notes that “If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact.” A significant impact is defined for CEQA purposes as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. A potentially significant impact is one that, if it were to occur, would be considered a significant impact; however, the occurrence of the impact is uncertain. A “potentially significant” impact and “significant” impact are treated the same under CEQA in terms of procedural requirements and the need to identify feasible mitigation. A less-than-significant impact is one that would not result in a substantial adverse change in the physical environment.

Both direct and indirect effects of the alternatives are evaluated for each environmental resource area. Direct effects are those that are caused by the action and occur at the same time and place. Indirect effects are reasonably foreseeable consequences that may occur at a later time or at a distance that is removed from the project area, such as growth-inducing effects and other effects related to changes in land use patterns, population density, or growth rate, and related effects on the physical environment.

Cumulative impacts are discussed in Section 3.16, not within each resource section and the approach is discussed in more detail below.

- **Mitigation Measures** are presented where feasible to avoid, minimize, rectify, reduce, or compensate for significant and potentially significant impacts of the project, in accordance with the State CEQA Guidelines (Section 15126.4) and NEPA regulations (40 CFR 1508.20) and TRPA Code of Ordinances. Each mitigation measure is identified numerically to correspond with the number of the impact being mitigated by the measure. If more than one mitigation measure is identified for an impact they are identified alphabetically. For example, mitigation measures in Section 3.3 are numbered 3.3-1A(Alt. 1), 3.3-1B(Alt. 1), 3.3-2A(Alt. 1), 3.3-2B(Alt. 1), and so on for Alternative 1 and impacts in Section 3.3 for Alternative 2 are numbered 3.3-1(Alt. 2), 3.3-2A(Alt. 2), 3.3-2B(Alt. 2), and so on. There are no mitigation measures proposed when the impact is determined to be “less than significant.” Where sufficient feasible mitigation is not available to reduce impacts to a less-than-significant level, the impacts are identified as remaining “significant and unavoidable.”

3.1.3 Cumulative Impact Analysis

Definition of Cumulative Impacts

Cumulative impacts are defined in the State CEQA Guidelines (Section 15355) as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.”

A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time.” Consistent with State CEQA Guidelines Section 15130[a], the discussion in this EIR/EIS/EIS focuses on significant and potentially significant cumulative impacts.

The NEPA regulations define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions over time and differ from indirect impacts (40 CFR 1508.8). They are caused by the incremental increase in total environmental effects, when the evaluated project is added to other past, present, and reasonably foreseeable future actions.

TRPA Code of Ordinances and Rules of Procedure do not include a definition of cumulative impacts. However, TRPA looks to NEPA and CEQA for guidance in assessing cumulative impacts (and thus the analysis contained in this document is sufficient for TRPA purposes).

METHODOLOGY

To identify the projects to be analyzed in the evaluation of cumulative impacts, Section 15130(b) of the State CEQA Guidelines recommends:

- the list approach, which entails listing past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or

- the projection approach, which uses a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact.

The approach and geographic scope of the cumulative impact evaluation vary depending on the environmental topic area being analyzed. Section 3.16, “Cumulative Impacts,” presents impacts and mitigation measures for each environmental topic area for Alternatives 1-5 (using a combined approach but discussing any differences in impacts or mitigation measures). Each impact begins with a summary of the approach and the geographic area relevant to that environmental topic area. For most environmental topic areas, the list approach is used. The list of potentially relevant projects as well as detailed methodology and relevant planning documents are discussed in detail in Section 3.16, “Cumulative Impacts”.

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3.2 LAND USE

This section describes the regulatory background, existing land uses in the study area and vicinity, and impacts of the proposed alternatives on land use. As described in Chapter 1, “Introduction and Statement of Purpose and Need,” the proposed alternatives would not have an impact on agricultural resources; therefore, this topic will not be discussed further. Cumulative effects are discussed in Section 3.16, “Cumulative Impacts.”

3.2.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

No Federal plans, policies, regulations, or laws related to land use are applicable to the proposed alternatives under consideration.

State

State Parks

The following Public Resource Code sections are relevant to land use within the within the study area and are listed below:

- **5002.2.(a)** Following classification or reclassification of a unit by the State Park and Recreation Commission, and prior to the development of any new facilities in any previously classified unit, the department shall prepare a general plan or revise any existing plan, as the case may be, for the unit. The general plan shall consist of elements that will evaluate and define the proposed land uses, facilities, concessions, operation of the unit, any environmental impacts, and the management of resources, and shall serve as a guide for the future development, management, and operation of the unit. The general plan constitutes a report on a project for the purposes of Section 21100. The general plan for a unit shall be submitted by the department to the State Park and Recreation Commission for approval.

- **5019.50.** All units that are or shall become a part of the state park system, except those units or parts of units designated by the Legislature as wilderness areas pursuant to Chapter 1.3 (commencing with Section 5093.30), or where subject to any other provision of law, including Section 5019.80 and Article 1 (commencing with Section 36600) of Chapter 7 of Division 27, shall be classified by the State Park and Recreation Commission into one of the categories specified in this article. Classification of state marine reserves, state marine parks, and state marine conservation areas, requires the concurrence of the Fish and Game Commission for restrictions to be placed upon the use of living marine resources.

- **5019.53**. State parks consist of relatively spacious areas of outstanding scenic or natural character, oftentimes also containing significant historical, archaeological, ecological, geological, or other similar values. The purpose of state parks shall be to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of ecological regions of California, such as the Sierra Nevada, northeast volcanic, great valley, coastal strip, Klamath-Siskiyou Mountains, southwest mountains and valleys, redwoods, foothills and low coastal mountains, and desert and desert mountains.

  Each state park shall be managed as a composite whole in order to restore, protect, and maintain its native environmental complexes to the extent compatible with the primary purpose for which the park was established.

Improvements undertaken within state parks shall be for the purpose of making the areas available for public enjoyment and education in a manner consistent with the preservation of natural, scenic, cultural, and ecological values for present and future generations. Improvements may be undertaken to provide for recreational activities including, but not limited to, camping, picnicking, sightseeing, nature study, hiking, and horseback riding, so long as those improvements involve no major modification of lands, forests, or waters. Improvements that do not directly enhance the public's enjoyment of the natural, scenic, cultural, or ecological values of the resource, which are attractions in themselves, or which are otherwise available to the public within a reasonable distance outside the park, shall not be undertaken within state parks.

State parks may be established in the terrestrial or nonmarine aquatic (lake or stream) environments of the state.

- **5019.56.** State recreation units consist of areas selected, developed, and operated to provide outdoor recreational opportunities. The units shall be designated by the commission by naming, in accordance with Article 1 (commencing with Section 5001) and this article relating to classification.

  In the planning of improvements to be undertaken within state recreation units, consideration shall be given to compatibility of design with the surrounding scenic and environmental characteristics.

  State recreation units may be established in the terrestrial or nonmarine aquatic (lake or stream) environments of the state and shall be further classified as one of the following types:

  (a) State recreation areas, consisting of areas selected and developed to provide multiple recreational opportunities to meet other than purely local needs. The areas shall be selected for their having terrain capable of withstanding extensive human impact and for their proximity to large population centers, major routes of travel, or proven recreational resources such as manmade or natural bodies of water. Areas containing ecological, geological, scenic, or cultural resources of significant value shall be preserved within state wildernesses, state reserves, state parks, or natural or cultural preserves, or, for those areas situated seaward of the mean high tide line, shall be designated state marine reserves, state marine parks, state marine conservation areas, or state marine cultural preservation areas.

  Improvements may be undertaken to provide for recreational activities, including, but not limited to, camping, picnicking, swimming, hiking, bicycling, horseback riding, boating, waterskiing, diving, winter sports, fishing, and hunting.

  Improvements to provide for urban or indoor formalized recreational activities shall not be undertaken within state recreation areas.

Lake Valley SRA General Plan

The California Parks and Recreation Commission classified Lake Valley State Recreation Area (SRA) in March 1987. This action included continuation of golfing and existing winter recreation activity as a formalized departmental objective (State Parks 1988:14). Section 5002.2 of the Public Resources Code requires State Parks to prepare a general plan or revise any existing plan after the State Park and Recreation Commission has classified or reclassified a unit of the State Park System, and before any new facilities are developed in a previously classified unit. To satisfy this requirement for the unit in which the study area for this project is located, State Parks prepared and adopted the *Lake Valley State Recreation Area General Plan* on May 13, 1988 (State Parks 1988). The general plan provides guidelines for long-term management and development of Lake Valley SRA. Lake Valley SRA and Washoe Meadows SP were purchased as one unit in 1985, but subdivided into two units because of existing golf course.

The Land Use Element of the General Plan determines uses of land within the SRA for providing recreational opportunities and public facilities consistent with the programs and policies identified in the General Plan's

Resource Element. It identifies developed and undeveloped land uses and provides recommendations for future uses within the SRA.

Specifically, the purpose of Lake Valley SRA, as described in the General Plan, is to make available an 18-hole golf course and the scenic Upper Truckee River and its environs for the enjoyment and inspiration of the public. State Parks must balance the objectives of providing optimum recreational opportunities and maintaining the highest standards of environmental protection. According to the General Plan purpose statement, State Parks must define and execute a management program for the unit that perpetuates the unit's declared values, providing for golfing and other compatible summer and winter recreation opportunities while restoring the natural character and ecological values of the Upper Truckee River, protecting its water quality, and protecting and interpreting significant natural, cultural, and scientific values.

Lake Valley State Recreation Area River Management Plan—Upper Truckee River

The General Plan called for preparation and implementation of a river management plan the purpose of which would be to restore a more natural channel configuration, to control unnatural bank erosion rates and to restore riparian habitat along the Upper Truckee River. The General Plan also stated that alternative methods of bank stabilization that minimize hard engineering would be given foremost consideration. State Parks landscape architect began preparation of the *Lake Valley State Recreation Area River Management Plan—Upper Truckee* River in the late 1990's. It was a draft internal planning study to provide informal guidelines for the management and development of Lake Valley SRA. At the time of plan preparation, it was assumed that the golf course would remain in its current configuration. The internal draft plan took the approach of combining erosion control and with golf recreation enhancement without reconfiguring the golf course. The river management plan only progressed to a partial internal draft and was never completed or formerly adopted by State Parks or reviewed under CEQA, and the effort was terminated because it did not meet the goals in the general plan to restore the Upper Truckee River. Instead a more detailed river analysis of the upper watershed was conducted by Swanson Hydrology, entitled "Upper Truckee River Upper Reach Environmental Assessment" (2004), as well as the *Upper Truckee River Restoration Project – Riparian Ecosystem Restoration Feasibility Report* (River Run Consulting 2006), which provided the foundation information for developing the river restoration concepts of the proposed project. Consequently, the River Management Plan does not provide direction to current restoration planning efforts at Lake Valley SRA.

Washoe Meadows State Park

According to the unit's purpose statement, adopted in 2000, the purpose of Washoe Meadows SP is to preserve and protect a wet meadow area associated with Angora Creek and the Upper Truckee River at the southwest side of the Tahoe Basin. The unit's associated forest areas sustain Jeffrey pine and an exceptionally large specimen of lodgepole pine (this tree has since died of natural causes). The unit contains 14 Native American occupancy sites and remnants of a historic dairy, and is contiguous to other public lands important for their open-space values and recreational uses. State Parks is responsible for preserving, protecting, restoring, interpreting, and managing the unit's natural, cultural, and aesthetic resources, features, and values, and for making them available to the public for their educational, inspirational, and recreational benefits (State Parks 2000b).

Informal parking, trails, and signage provide initial public access and information to park visitors. Because no new facilities have been proposed or developed within Washoe Meadows, no general plan has been prepared for this unit.

California State Lands Commission

The California State Lands Commission (CSLC) has jurisdiction and management authority over 4.5 million acres of land held in trust for Californians. The commission's jurisdiction includes the beds of navigable rivers, sloughs, and navigable lakes, including the California portion of Lake Tahoe and the Upper Truckee River. The State of California holds these lands for the public-trust purposes of water-related commerce, navigation, fisheries, environmental preservation, recreation, and open space. Based on its public-trust authority, CSLC reviews and may grant dredging permits and issue land-use leases for activities within its jurisdiction. It does not have a comprehensive use plan for these lands but manages them according to State laws and regulations.

CSLC regulates an established public trust for navigable waterways within California. The public-trust doctrine is the principle that certain resources are preserved for public use, and that the government is required to maintain it for the public's reasonable use. This public-trust easement allows access along the river channel. The use of public-trust lands is generally limited to water-dependent or related activities: commerce, navigation, fisheries, environmental preservation, recreation, and open space.

Tahoe Regional Planning Agency

1987 Regional Plan

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (*Regional Plan*). The *Regional Plan* includes several documents relevant to land use: environmental threshold carrying capacities, Goals and Policies, Code of Ordinances, Plan Area Statements, and Water Quality Management Plan. Chapter 5, "Compliance with Applicable Federal Laws and Executive Orders and State Laws and Regulations," of this draft EIR/EIS/EIS provides additional information on TRPA and other agency regulatory and planning processes for the Tahoe Basin.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011. For Pathway, TRPA is reevaluating nine environmental threshold carrying capacities (thresholds) it established previously to define the levels of environmental quality desired for the region. New research, science, and collaboration at the community level will contribute to development of the updated report. For the purpose of this evaluation, the 1987 Regional Plan currently in effect will be applied.

Regional Plan Goals and Policies

The Goals and Policies document for the 1987 *Regional Plan* establishes an overall framework for development and environmental conservation in the Lake Tahoe region. TRPA goals and policies are included in six elements: land use, transportation, conservation, recreation, public services and facilities, and implementation (TRPA 2004). The goals and policies relevant to the project are listed in Table 3.2-1, presented at the end of this section, and are discussed in "Environmental Consequences," below.

Code of Ordinances

The TRPA Code of Ordinances establishes standards and regulations for implementation of the *Regional Plan* for the Tahoe Basin. Public agencies and organizations in the basin must comply with TRPA provisions or may establish equivalent or higher requirements in their jurisdictions. The Code of Ordinances is a coordinated series of documents addressing environmental and land use planning issues in the Tahoe Basin, including the Tahoe Regional Planning Compact, environmental threshold carrying capacities, Goals and Policies, the Plan Area Statements and maps, and other TRPA plans and programs. The Code of Ordinances is intended to implement the Goals and Policies while maintaining the environmental thresholds (TRPA 1991).

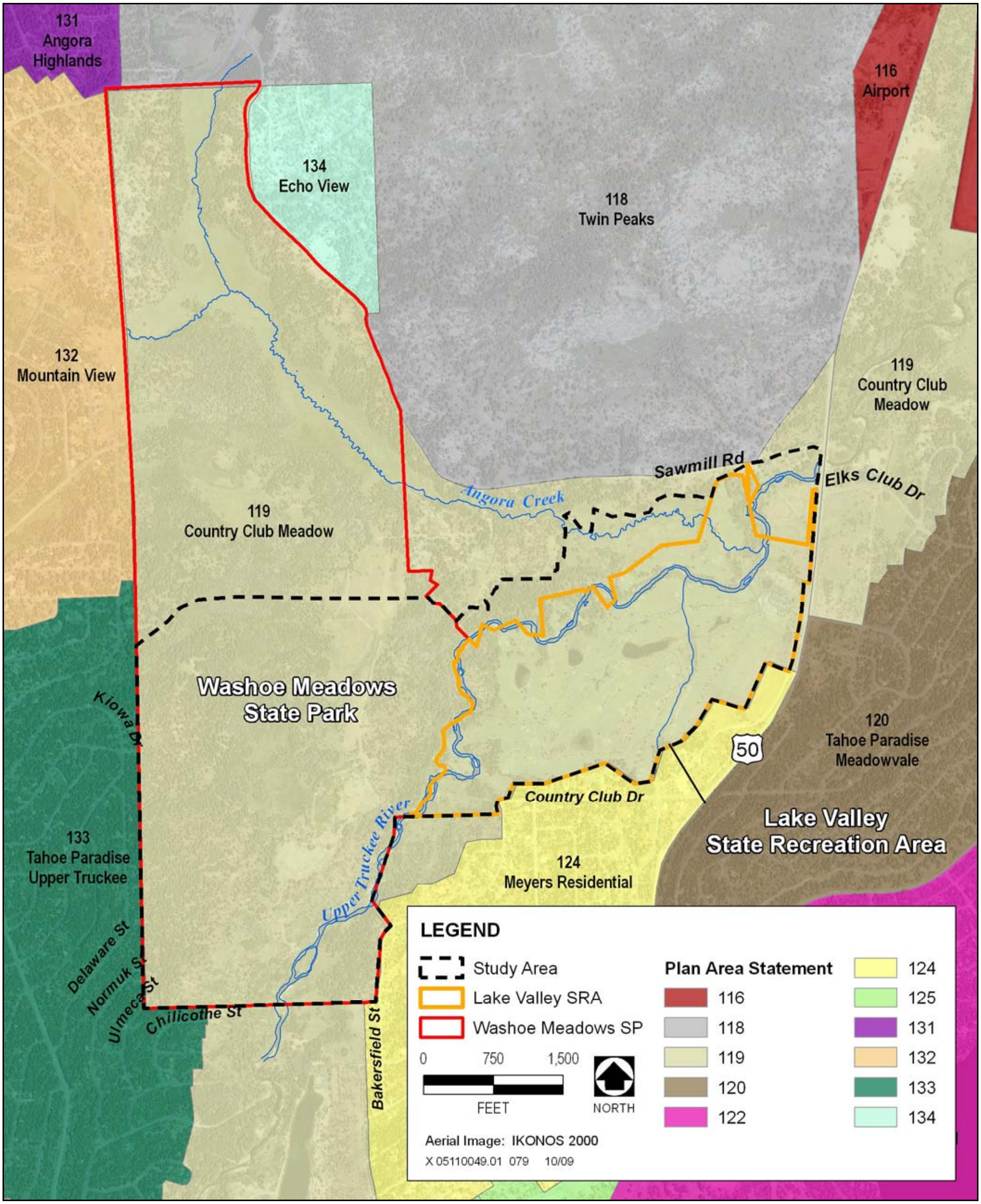
Plan Area Statements

Chapter 13, "Plan Area Statements and Plan Area Maps," of the TRPA Code of Ordinances requires that all projects and activities be consistent with the provisions of a particular area's applicable plan area statement (PAS). The Lake Tahoe region is divided into more than 181 separate plan areas. For each plan area, a "statement" is made describing how that particular area should be regulated to achieve environmental and land use objectives and providing detailed plans and policies for specific areas of the basin. The written text and maps in the PAS provide specific land use policies and regulations for each planning area. PASs also serve to promote and protect the public health and safety as well as the general welfare and environment. El Dorado County has adopted TRPA PASs, which define land use classification, planning considerations, special policies, and permissible uses of land in the Tahoe Basin. The study area is located within PAS 119 (Country Club Meadow).

Project planning must recognize the PAS requirements and limitations on permissible uses. The following PAS description includes land use classification and management strategy. Permissible uses for this PAS are listed in Table 3.2-2. The establishment of new uses not listed is prohibited within any plan area. Existing uses not listed are considered nonconforming uses within a given plan area.

PAS 119 includes the area from the Upper Truckee River near the airport to the bridge at the bottom of the Echo Summit grade (Exhibit 3.2-1). Developed facilities within PAS 119 include residences, the Lake Tahoe Golf Course, snowmobile courses, and stables. Approximately 80 percent of the existing environment is classified as Stream Environment Zone (SEZ), and the dominant feature of this PAS is the Upper Truckee River. The current land use designation is Recreation with a special designation of Scenic Restoration Area. Allowable recreation uses in PAS 119 include day-use areas, riding and hiking trails, developed campgrounds, outdoor recreation concessions, golf courses, and visitor information centers. Allowable resource management uses in PAS 119 include reforestation, nonstructural fish habitat management, nonstructural wildlife habitat management, prescribed fire management, sensitive plant management, uncommon plant community management, erosion control, runoff control, and SEZ restoration. The planning statement for PAS 119 is "This area should be managed for outdoor recreation and natural resource values to include opportunities for SEZ restoration." Accessory uses related to these allowed land uses may also be permitted pursuant to the definition of accessory uses in Chapter 18 of the TRPA Code of Ordinances, Subsection 18.2 (TRPA 2005). The following special policies of PAS 119 apply to the study area:

- Areas of significant resource value or ecological importance within this Plan Area should be designated as natural areas, and they should be buffered from intensive uses.
- Whenever possible, opportunities for restoration of disturbed SEZs and land coverage removal should be encouraged, including strategies to mitigate the impacts of the golf course.
- A stream channel maintenance program should be implemented to protect the value of the river as a fishery and to minimize the risks of bank erosion.
- Creation of waterfowl habitats in association with restoration efforts of disturbed areas should be encouraged.
- Improved river access for fishing should be provided.
- Intensive uses in this Plan Area that require development of impervious coverage should be discouraged.
- The Upper Truckee River should be designated as a catch-and-release fishery area.



Source: TRPA 2009

Plan Area Statements **Exhibit 3.2-1**

Table 3.2-2
Permissible Uses for Plan Area Statement 119

GENERAL	
Residential	Domestic animal raising (S), single family dwellings (S) and summer homes (S)
Public Service	Pipelines and power transmission (S), local post office (S), local public health and safety facilities (S), public utility centers (S), transmission and receiving facilities (S), transportation routes (S), and transit stations and terminals (S)
Recreation	Cross country skiing courses (S), day-use areas (A), riding and hiking trails (A), participant sports (S), developed campgrounds (A), outdoor recreation concessions (A), rural sports (S), group facilities (S), golf courses (A), snowmobile courses (S), and visitor information area (A)
Resource Management	Reforestation (A), sanitation salvage cut (A), Management special cut (S), thinning (A), timber stand improvement (S), tree farms (S), early successional stage vegetation management (A), nonstructural fish/wildlife habitat management (A), structural fish/wildlife habitat management (S), farm/ranch accessory structures (s), grazing (S), range pasture management (S), range improvement (S), fire detection and suppression (A), fuels treatment (A), insect and disease suppression (A), prescribed fire management (A), sensitive and uncommon plant community management (A), erosion control (A), runoff control (A), and SEZ restoration (A)

Notes: SEZ = Stream Environment Zone. The list indicates whether the use is allowed (A) or must be considered under the provisions for a special use (S). Existing uses not listed are considered nonconforming uses within this plan area.
Source: TRPA 2005

Environmental Threshold Carrying Capacities

In August 1982, TRPA adopted Resolution No. 82-11, which adopted environmental threshold carrying capacities (thresholds) for the Lake Tahoe region. TRPA threshold criteria have been established for water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation. Although TRPA does not have an articulated land use threshold, land use objectives are achieved through implementation of TRPA's Code of Ordinances and Goals & Policies, as well as through implementation of specific transportation policies and design review guidelines.

El Dorado County

El Dorado County shares responsibility for regulation of land use policies within its unincorporated portions of the Tahoe Basin. The study area is within El Dorado County; however, the County does not have jurisdiction over use of State lands. The *El Dorado County General Plan* is designed to integrate El Dorado County's regulations with those of TRPA within the Tahoe Basin. This eliminates inconsistencies with the *Regional Plan* (recognizing that TRPA regulations may change over time), and simplifies the regulatory environment in the Tahoe Basin (El Dorado County 2004).

Within the *El Dorado County General Plan*, the following policies are relevant to land use within the project vicinity and are listed below:

GOAL 2.10: Lake Tahoe Basin. To coordinate the county's land use planning efforts in the Tahoe Basin with those of the TRPA.

- **Policy 2.10.1.1:** The County shall apply the standards of the Regional Plan for the Tahoe Basin and the Code of Ordinances and other land use regulations adopted by TRPA in acting on applications for proposed land uses in the Tahoe Basin.

- **Policy 2.10.1.4:** The County shall cooperate with TRPA in the implementation of actions recommended in TRPA's periodic threshold evaluation reports.

- **Policy 2.10.1.5:** The County may impose more stringent regulations where TRPA does not limit the County's authority to do so.

Additionally, Measure LU-O sets forth a timeline for coordination with TRPA and other agencies having land use jurisdiction in the Tahoe Basin to create a comprehensive approach to land use regulation in the basin. This measure specifies actions to be taken including modification of El Dorado County's Zoning Ordinance to be consistent with or adopt as county code, the TRPA Code of Ordinances, and PASs. Also, the measure requires implementation of actions recommended in TRPA's periodic threshold evaluation reports.

City of South Lake Tahoe

The *City of South Lake Tahoe General Plan* was adopted in 1999 and amended in 2002 and 2003. The land use vision described in the general plan specifically addresses the commercial corridor along U.S. 50 adjacent to the study area. The vision is to remove the "strip commercial uses" and reestablish distinct "villages" reminiscent of early South Shore development along the highway (City of South Lake Tahoe 1999). There are no specific City of South Lake Tahoe land use goals and objectives relevant to the study area.

Lake Tahoe Airport Comprehensive Land Use Plan

The *Lake Tahoe Airport Comprehensive Land Use Plan* (CLUP) establishes planning boundaries for the Lake Tahoe Airport and defines compatible types and patterns of future land uses that might occur in the area surround the airport (City of South Lake Tahoe 2007). The purpose of the CLUP is to provide the Lake Tahoe Airport area with compatibility guidelines for height, noise, and safety.

The CLUP designates airport safety zones to the land surrounding the airport to minimize the number of people exposed to aircraft crash hazards. This is accomplished by enforcing land use restrictions in the safety zones. The CLUP designates three safety zones:

- the clear zone, which is near the runway and is the most restrictive;

- the approach/departure zone, which is located under the takeoff and landing slopes for each runway, extends outward for 5,000 feet from Runway 36 (with a width of 500–1,500 feet) and 10,000 feet from Runway 18 (with a width of 1,010–3,500 feet), and is less restrictive than the clear zone; and

- the overflight zone, which is the area overflown by aircraft during the normal traffic pattern, extends in all directions 5,000 feet from the center of each end of each runway, and is the least restrictive.

ENVIRONMENTAL SETTING

The study area is located within Planning Area 119 (Country Club Meadow) (see "Plan Area Statements" in "Regulatory Background," above). Existing adjacent and nearby land uses consist primarily of residential development and publicly owned open space, as described below and shown in Chapter 1, "Introduction and Statement of Purpose and Need," Exhibit 1-2, "Study Area/Property Boundaries."

Lake Valley State Recreation Area

The entire 181 acres of Lake Valley SRA are within the study area. The SRA consists of relatively flat open land surrounded primarily by coniferous forest and residential development. The average elevation of the SRA is 6,280 feet. Of the 181 total acres, approximately 133 acres of the Lake Valley SRA are developed for use as the Lake Tahoe Golf Course. This course is open to the public and is managed by State Parks and operated through a concession agreement with the American Golf. The 18-hole golf course includes a clubhouse, restaurant, golf shop, and driving range, and hosts tournaments and events. The remaining area of Lake Valley SRA includes a portion of the Upper Truckee River that runs through the golf course and pockets of undeveloped stands of coniferous forests, meadows, and riparian woodlands (State Parks 2000a). The purpose of Lake Valley SRA is to make available to the public for their enjoyment and inspiration the 18-hole golf course, and the scenic Upper Truckee River and its environs. The unit was classified as a SRA to assure continuation of the golfing activity and winter recreation as a formalized departmental objective. Classification as an SRA recognizes the significance of the unit in perpetuating an existing quality public golfing opportunity in the increasingly popular Tahoe basin, where golfing demand far exceeds the opportunities (State Parks 1988:34).

North of the Lake Valley SRA portion of the study area is Sawmill Road, forestland, and residential uses. The areas east and south of Lake Valley SRA include residential uses and U.S. 50. West of Lake Valley SRA is the Washoe Meadows SP. The Upper Truckee River flows along the western boundary of Lake Valley SRA, dividing the SRA from Washoe Meadows SP. In addition, parcels of Conservancy lands are adjacent to the SRA and along the Upper Truckee River to the north.

Washoe Meadows State Park

Washoe Meadows SP occupies 620 acres, the southern half of which is located in the study area. The park is located in the valley at the base of the escarpment leading to Echo Summit. This park includes a variety of resources: wet meadow, Jeffrey pine, lodgepole pine, Native American occupancy sites, and remnants of a historic dairy (State Parks 2000b). Prior to becoming a State Park, past uses included grazing, dairy operation, timber harvest, gravel extraction, and various types of motorized and non-motorized recreation. Inactive aggregate (sand and gravel) quarry sites are located in Washoe Meadows SP along the park’s eastern boundary. The quarry sites consist of 3 contiguous lobes, trending north-northeast totaling approximately 17 acres. The quarry sites were developed in the mid-1960s, and it is estimated that the sites produced between 120,000 and 150,000 cubic yards of aggregate (Shasha, pers. comm., 2007).

The area north of the Washoe Meadows SP portion of the study area is Lake Tahoe Boulevard and forest land. East of Washoe Meadows SP is the Lake Valley SRA, and to the northeast are residential uses. Residential uses, forest land, and Lake Baron lie south of Washoe Meadows SP. In addition, residential uses border the entire west edge of Washoe Meadows SP.

Lake Tahoe Airport

The Lake Tahoe Airport is located approximately 1-mile northeast of the study area along U.S. 50. The Lake Tahoe Airport is owned and operated by the City of South Lake Tahoe. The airport is equipped to serve as a commercial air carrier/general aviation airport, although it does not currently support commercial flights and there is no commercial operator at the airport. The airport has one north-south asphalt runaway, which is 8,544 feet long by 150 feet wide. The Lake Tahoe Airport is adjacent to the Upper Truckee River downstream of the study area. A small portion of the northeast corner of the study area, adjacent to Sawmill Road and U.S. 50 is within the overflight zone (See Section 3.14, “Human Health and Risk of Upset,” for additional information on the Lake Tahoe Airport).

Residential Subdivisions

The study area is bordered by two other PASs: PAS 124 (Meyers/Residential) and PAS 133 (Tahoe Paradise–Upper Truckee). Both of these areas have residential land use classifications.

Meyers/Residential

The Meyers/Residential plan area is located in Meyers, California, and is just west of the Meyers commercial area. It includes all residential streets west of U.S. 50, south of the Lake Tahoe Golf Course, and north of the Upper Truckee River/U.S. 50 bridge.

The primary use of this area is residential at a density of one single-family dwelling per parcel of record. An elementary school, Lake Tahoe Environmental Science Magnet School, also exists in this area. The area is 55 percent of built out.

This plan area is immediately east of the study area, and Bakersfield Street runs along the southernmost portion of the eastern boundary of the study area. Country Club Drive runs along the middle of the eastern study area boundary and terminates at the edge of the study area.

Tahoe Paradise–Upper Truckee

The Tahoe Paradise–Upper Truckee planning area consists of the residential subdivisions located west of Meyers along North Upper Truckee Road. This area is residential at a density of one single-family dwelling per parcel of record, and the area is approximately 45 percent of built out.

This area is immediately west and south of the study area. It includes a portion of the North Upper Truckee residential area and includes neighborhoods in the vicinity of Kiowa Drive, Delaware Street, Normuk Street, Ulmeca Street, and Chilicothe Street. Portions of both Kiowa Drive and Delaware Street run parallel to the western boundary of the study area. Normuk and Ulmeca Streets terminate at the western boundary of the study area, and a part of Chilicothe Street runs along the southern boundary of the study area.

3.2.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, effects on environmental threshold carrying capacities (thresholds) of the Tahoe Regional Planning Compact were considered. The project’s effects on thresholds are further described in Chapter 4, Section 4.6, “Consequences for Environmental Threshold Carrying Capacities.”

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, a land use impact is considered significant if implementation of the project would do any of the following:

- physically divide an established community;
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- conflict with any applicable habitat conservation plan or natural community conservation plan.

In addition, Appendix G includes a question regarding loss of forest land or conversion to non-forest use. This topic is addressed in Section 3.5, Biological Resources.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on land use if it would:

- include uses that are not listed as permissible uses in the applicable Plan Area Statement, adopted community plan, or master plan or

- expand or intensify an existing nonconforming use.

METHODS AND ASSUMPTIONS

The focus of this draft EIR/EIS/EIS analysis is on land use impacts that would result from implementation of any of the proposed alternatives. In addition, the need for an amendment of the Lake Valley SRA General Plan is discussed for each alternative. The general plan amendments proposed for the alternatives are also described in Chapter 2 so that they are considered as part of the project description for purposes of environmental impact analysis under NEPA. After a preferred alternative is identified, the details of the map and text amendments to the general plan would be prepared to reflect the changes discussed in Chapter 2. The proposed amendment would then be submitted with the completed EIR/EIS/EIS to the State Parks and Recreation Commission for consideration of approval at the conclusion of the environmental review process.

Evaluation of potential land use impacts of the project was based on land use reconnaissance conducted in the areas surrounding the study area and a review of the planning documents that pertain to the study area:

- *Lake Valley State Recreation Area General Plan* (State Parks 1988),
- *Regional Plan for the Lake Tahoe Basin* (adopted in 1982) (TRPA 2004),
- PAS 119 (Country Club Meadow) (TRPA 2005), and
- *Lake Valley State Recreation Area River Management Plan* (not formally adopted [State Parks 2000a]).

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Habitat Conservation Plans/Natural Community Conservation Plans – There are no habitat conservation plans or natural community conservation plans that are applicable to the study area; therefore, this topic will not be discussed further.

Community Plans/Master Plans – There are no community plans or master plans that are applicable to the study area; therefore, this topic will not be discussed further.

Changes in zoning and forest land effects - No environmental impacts would occur related to changes in zoning, including any that could affect forest land. The zoning of the study area is expressed by the Planning Area Statement (PAS), and no changes to the PAS are proposed as part of this project.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.2-1 (Alt. 1)	Potential to Physically Divide an Established Community. *Implementation of Alternative 1 would not involve construction of new facilities within the study area, and existing land uses would continue into the future. Over time, existing natural and artificial features and natural processes would not create a new physical division in the study area or within adjacent established communities. Therefore, implementing Alternative 1 would not create a physical division within an established community.* ***No impact*** *would occur.*

In the foreseeable future under Alternative 1, existing natural and artificial features within the study area (e.g., the existing river, golf course, trails) are not expected to create any new physical division within the study area or within an established community in the vicinity of the study area. Implementation of Alternative 1 would not involve construction of new facilities or substantial physical alterations of the study area. The existing roads and trails would remain in their current locations and, presumably, would continue to be used for the purposes for which they are used today. All trails on the western side of the river are casual or volunteer trails. No trails within the study area are officially established or designated trails; instead, they have been formed over time through routine use. The golf bridges would remain closed to public use unrelated to golf because of safety hazards and liability. No new public trails would be constructed. Therefore, there would be no changes to public access, and implementing Alternative 1 would not divide an established community. There would be no impact.

No mitigation is required.

IMPACT 3.2-2 (Alt. 1)	Potential Conflict with Land Use Plans, Policies, or Regulations Intended to Protect the Environment. *Alternative 1 would not include any new facilities, new land uses, or any new nonconforming uses in the study area that would conflict with applicable plans, policies, or regulations intended to protect the environment. Therefore, this impact would be* ***less than significant****.*

Under Alternative 1, existing conditions in the study area would continue into the future. The reach of the Upper Truckee River within the study area would not be restored, and the 18-hole regulation golf course would remain as it currently exists. Repairs to the river and golf course would continue on an emergency or as-needed basis, as has occurred in the recent past and would not preclude future restoration. Recreational uses permitted under PAS 119 include riding and hiking trails, outdoor recreation concessions, golf courses, and visitor information centers, and other recreational uses (See Section 3.8, “Recreation”). Resource management uses permitted under PAS 119 include erosion control, runoff control, and SEZ restoration. Existing land uses are consistent with allowable uses under PAS 119, and implementation of Alternative 1 would not alter land uses in the study area. Alternative 1 is the No Project/No Action Alternative where non-conforming uses predate the TRPA *Regional Plan*. Furthermore, several Goals and Policies are related to implementation of a project; therefore, are not relevant to the No Project/No Action Alternative. Alternative 1 would not intensify or expand on any nonconforming uses. In addition, because Alternative 1 would result in continuation of existing land uses where non-conforming uses predate the *Regional Plan*, this alternative would not result in any changes to the consistency of land uses in the study area. Therefore, Alternative 1 would be consistent with the TRPA *Regional Plan* goals and policies, as shown in Table 3.2-1.

Because implementing Alternative 1 would not conflict with applicable plans, policies, and regulations intended to protect the environment, this impact would be less than significant

No mitigation is required.

IMPACT 3.2-3 (Alt. 1) **Potential Conflict with State Parks Plans, Policies, and Regulations.** *Implementation of Alternative 1 would include continuation of existing land uses in the study area into the future. The Lake Valley SRA General Plan calls for restoring the natural character and ecological values of the Upper Truckee River, which would not occur under Alternative 1. However, implementation of Alternative 1 would include emergency spot repair of the river and would be a continuation of existing conditions. Repairs, under this alternative, would be localized stabilization treatments designed to slow erosion and protect infrastructure, but would not restore natural channel morphology or function. Because there would be no changes to existing land uses, this alternative would be consistent with State Parks plans, policies, and regulations. This impact would be* ***less than significant****.*

Under Alternative 1, existing land uses, including the 18-hole golf course and repairs to the river and golf course on an emergency or as-needed basis, would continue into the future. The purpose of the Lake Valley SRA is to make available to the people for their enjoyment and inspiration the 18-hole golf course and the scenic Upper Truckee River and its environs. The Lake Valley SRA General Plan provides that the SRA be used for golfing, along with other compatible summer and winter recreation opportunities, while restoring the natural character and ecological values of the Upper Truckee River (State Parks 1988). According to Public Resources Code Section 5019.53, units classified as state parks “consist of relatively spacious areas of outstanding scenic or natural character, often times also containing important historical, archaeological, ecological, geological, or other similar values. The purpose of state parks shall be to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of ecological regions of California.” In accordance with Public Resources Code Section 5019.56, state recreation areas “consist of areas selected, developed, and operated to provide outdoor recreational opportunities.” SRA’s are “selected and developed to provide multiple recreational opportunities to meet other than purely local needs. The areas shall be selected for their having terrain capable of withstanding extensive human impact…”

The purpose of the Lake Valley SRA is to make available to the public an 18-hole golf course and the scenic Upper Truckee River and its environs. The LVSRA General Plan calls for restoration of the Upper Truckee River and provision of an 18-hole regulation golf course. Alternative 1 would not include full geomorphic restoration of the Upper Truckee River within the study area; however, it would continue the existing management approach of protecting water quality, natural resources, and cultural resources to the extent feasible with repairs to existing bank stabilization, infrastructure, and additional spot stabilization in response to erosion, damage, or failures. Amendment of a general plan is not required for this situation, as described in Public Resources Code Section 5002.2(c). The existing 18-hole golf course would remain within the current footprint under Alternative 1; therefore, no changes to the existing boundaries or land uses in Lake Valley SRA or in Washoe Meadows SP would be needed.

No general plan was prepared for the Washoe Meadows SP, because the wet meadow area associated with Angora Creek and the Upper Truckee River is protected and no substantial, permanent facilities have been developed in the unit. Consistency with a general plan is, therefore, not an issue; however, Alternative 1 would be consistent with the purpose statement of Washoe Meadows SP. In addition, implementation of Alternative 1 would not preclude preparation of a general plan for Washoe Meadows SP in the future. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of substantial, permanent facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

Because there would be no changes to existing land uses, this alternative would not conflict with State Parks plans, policies, or regulations. This impact would be less than significant.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.2-1 (Alt. 2)

Potential to Physically Divide an Established Community. *Implementation of Alternative 2 would include relocation of golf course holes within Washoe Meadows SP, which would reduce access to portions of Washoe Meadows SP from adjacent neighborhoods. However, Alternative 2 would include new trails and a pedestrian path through the golf course that would improve connectivity between the east and west sides of the river. In addition, the golf course would be entirely on public land and would not divide an established community. Because connectivity would be maintained and no established communities would be divided, this impact would be* ***less than significant****.*

Under Alternative 2, all five existing golf course bridges and the four golfer/cart path bridges across Angora Creek would be removed, and seven full and two partial golf course holes would be relocated to the west side of the river. Because public access across the existing bridges is prohibited for safety reasons, their removal would not substantially reduce public access by adjacent neighborhoods to proposed golf course areas west of the river. In fact, a new bridge designed to allow both golfer use and safe public access would be included with the reconfigured golf course, so an authorized public access facility would be established. Also, a portion of Lake Valley SRA along east side of river that is now golf course would be opened to public use, increasing access with this portion of the study area.

A new designated trail system would be constructed under Alternative 2 to tie the informal, volunteer recreation trails on the west side of the river to new trails on the east side of the river via a new bridge. The recreation trail would share the new bridge with the golf cart path and would then diverge into separate paths on both sides of the river. There would be two new recreation trails on the east side of the river connecting to the bridge. One would extend to the south and tie into the corner of Country Club Drive and Bakersfield Street, whereas the other would extend along the south side of the river to the east and tie into the new Sawmill Bike Path along U.S. 50 near the golf course clubhouse. A new trail would also be constructed around the north end of the western section of the golf course that would allow access across the new bridge. The recreation trail would share the cart path in the central area of the western holes where a gap in the golf course would provide a corridor for other recreation users to safely pass through the golf course to the river and tie into the gravel road that parallels the river. This gravel road is currently, and would continue to be, used by the South Tahoe Public Utility District as a required maintenance road. This proposed trail configuration would enable public access and use into and within the area. As previously noted, the existing golf course bridges that would be removed are currently closed to public use unrelated to golf because of safety hazards. Also, a forested buffer between 150 and 400 feet wide would remain intact between all existing houses and the relocated golf course holes.

Because Alternative 2 would provide public access through the relocated golf course and improve connectivity between the east and west side of the river, this impact would be less than significant.

No mitigation is required.

IMPACT 3.2-2 (Alt. 2)

Potential Conflict with Land Use Plans, Policies, or Regulations Intended to Protect the Environment. *Alternative 2 would include a reconfigured 18-hole golf course and restoration of the Upper Truckee River within the study area. These proposed land uses would be consistent with applicable plans, policies, and regulations intended to protect the environment. This impact would be* ***less than significant****.*

Under Alternative 2, the 18-hole golf course would be reconfigured, and the reach of the Upper Truckee River within the study area would be restored. Informal outdoor recreation would continue within the northern portion of Washoe Meadows SP, and snowmobiling would continue to be limited to the driving range at the golf course. Permitted uses under PAS 119 include golfing, outdoor recreation, snowmobiling, and SEZ restoration. Therefore, the land uses proposed under Alternative 2 would be consistent with allowable uses under PAS 119. Because the existing and proposed land uses in the study area are allowable under PAS 119, Alternative 2 would not intensify or expand on any nonconforming uses. In addition, these proposed land uses would be consistent with the TRPA *Regional Plan* goals and policies, as discussed in Table 3.2-1. Thus, implementing Alternative 2 would not conflict with applicable plans, policies, or regulations intended to protect the environment. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.2-3 (Alt. 2)	**Potential Conflict with State Parks Plans, Policies, and Regulations.** *Reconfiguration of the golf course would relocate seven and two partial golf course holes to Washoe Meadows SP. Golf courses are not consistent with the designation of Washoe Meadows as a state park. However, implementation of Alternative 2 would include changes to the boundaries of Lake Valley SRA and Washoe Meadows SP and an amendment of the Lake Valley SRA General Plan to accommodate reconfiguration of the golf course. This impact would be* ***less than significant****.*

The holes that would be relocated under Alternative 2 would be reconstructed on the west side of the Upper Truckee River within lands currently designated as Washoe Meadows SP. State Recreation Areas and State Parks have different purposes, as defined under Public Resources Code Section 5019, and golf course recreation is better suited to State Recreation Areas rather than State Park designation.

Relocation of the golf course holes would not be consistent with the purpose of Washoe Meadows SP, Alternative 2 would include revising the park unit boundaries, essentially trading land between Washoe Meadows SP and Lake Valley SRA, and realigning the boundaries between the two park units. Revising the park unit boundaries would be supported by appropriate policy changes, such as adopting revised management policies for the Lake Valley SRA. This boundary change would allow the total acreages of the SRA and SP to be similar to existing conditions.

Alternative 2 carries out the primary direction of the current Lake Valley SRA General Plan. It allows for geomorphic restoration of the river and maintains the regulation-length golf course. The general plan text and map amendment would be needed only to modify, where necessary, the application of Lake Valley SRA river protection goals and policies to the reconfigured golf course area. The revised park unit boundaries would remove nearly all the river zone from the Lake Valley SRA and designate it as lands within Washoe Meadows SP, because its primary function would become resources management rather than golf recreation (See Chapter 2, "Project Alternatives," Exhibit 2-5). The only section of river remaining in the Lake Valley SRA would be in the vicinity of the new bridge crossing. The area north of the river along Angora Creek would also be moved from Lake Valley SRA to Washoe Meadows SP. Adjusting the boundaries of the two units and amending the Lake Valley SRA General Plan would require approval by the State Parks and Recreation Commission, including a finding that these actions are consistent with the Public Resources Code. Where golf course footprint is relocated into what is now Washoe Meadows SP, that area would be designated as Lake Valley SRA.

State Parks has not prepared a general plan for Washoe Meadows SP, and the general plan amendment for Lake Valley SRA General Plan would not include plan elements for Washoe Meadows SP. Consistency with a general plan is, therefore, not an issue, because a Washoe Meadows SP plan does not exist. As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land; however, additional development in the remaining park area would not occur because most of the park is within sensitive, low-capability lands. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

Because the end land uses in the study area would be consistent with the revised unit boundaries and these amendments would require approval by the State Parks and Recreation Commission, implementation of Alternative 2 would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.2-1 (Alt. 3)	Potential to Physically Divide an Established Community. *Implementation of Alternative 3 would include restoration of the river and a reduced play golf course on the east side of the river. Implementing this alternative would not divide an established community. While the five existing golf course bridges over the Upper Truckee River and four of the golf course bridges across Angora Creek would be removed, these bridges do not provide authorized public access for safety reasons. Therefore, authorized public access and connectivity from surrounding communities would not be adversely affected. This impact would be* ***less than significant****.*

Alternative 3 would include restoration of the river and a reduced play golf course on the east side of the river. No golf course holes would be relocated to Washoe Meadows SP. However, all five bridges across the Upper Truckee River and the four golfer/cart path bridges across Angora Creek would be removed. The existing bridges across the unnamed creek would remain, with the northernmost bridge being redesignated as part of the proposed trail system. Under Alternative 3, a pedestrian path would be established along the northern edge of the proposed reduced play golf course. This designated trail would run from a tie-in to the Sawmill bike trail at U.S. 50, just north of the main entrance to the golf course along the river, to the corner of Country Club Drive and Bakersfield Street. No trail work is proposed on the west side of the river under this alternative.

No golf course holes would be relocated to the west side of the river under this alternative; therefore, implementing Alternative 3 would not reduce access to portions of Washoe Meadows SP from the adjacent neighborhoods. In addition, the nine golf course bridges that would be removed are currently closed to public use unrelated to golf because of safety hazards from golf balls in play.

Because implementing Alternative 3 would not divide an established community and authorized public access would not be reduced, this impact would be less than significant.

No mitigation is required.

IMPACT 3.2-2 (Alt. 3)	Potential Conflict with Land Use Plans, Policies, or Regulations Intended to Protect the Environment. *Alternative 3 would include a reduced play golf course and restoration of the Upper Truckee River within the study area. These proposed land uses would be consistent with applicable plans, policies, and regulations intended to protect the environment. This impact would be* ***less than significant****.*

This impact would be similar to Impact 3.2-2 (Alt. 2) because the proposed land uses would be consistent with allowable uses under PAS 119 and the TRPA *Regional Plan* goals and policies, as discussed in Table 3.2-1. Implementing Alternative 3 would not intensify or expand any nonconforming uses. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-3 (Alt. 3)	Potential Conflict with State Parks Plans, Policies, and Regulations. *Operation of a reduced play golf course under Alternative 3 would not be consistent with the 18-hole regulation golf course identified in the Lake Valley SRA General Plan. However, the Lake Valley SRA General Plan would be amended to allow for a reduced play golf course, which would make the proposed land uses in the study area consistent with the General Plan. This impact would be* ***less than significant****.*

The purpose of the Lake Valley SRA is to make available to the people the 18-hole golf course and the scenic Upper Truckee River and its environs. Alternative 3 would include restoration of the Upper Truckee River within the study area; however, the existing 18-hole golf course would be reconfigured to a 9-hole or 18-hole executive (i.e., short hole length) course, which is not consistent with the goals of the current General Plan. Therefore, the General Plan would be amended to modify, where necessary, the application of Lake Valley SRA recreation goals and policies to the reduced play golf course. Adoption of the Lake Valley SRA General Plan amendment would require approval by the State Parks and Recreation Commission, including a finding that the policy changes are consistent with the Public Resources Code.

Alternative 3 would not involve relocating any golf course holes to the west side of the river; however, this alternative would reduce the size of the golf course footprint and increase the area of restored riparian area. Therefore, changes in the boundaries between Washoe Meadows SP and Lake Valley SRA would be necessary to adjust the SRA boundary to fit the smaller golf course. In keeping with the respective purposes of Washoe Meadows SP and Lake Valley SRA, the boundary of Washoe Meadows SP would be adjusted (in this case, expanded) to encompass all of the restored river and riparian corridor.

State Parks has not prepared a general plan for Washoe Meadows SP, and the general plan amendment would not include plan elements for Washoe Meadows SP. Consistency with a general plan is, therefore, not an issue, because a Washoe Meadows SP plan does not exist. As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

Because the end land uses in the study area would be consistent with the revised unit boundaries and these amendments would require approval by the State Parks and Recreation Commission, implementation of Alternative 3 would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.2-1 (Alt. 4)

Potential to Physically Divide an Established Community. *Implementation of Alternative 4 would include stabilization of the river in place and only minor changes to the existing golf course and bridges. Because the golf course would remain in its current location, there would be no change to authorized access or connectivity from surrounding communities and this alternative would not divide an established community. This impact would be* ***less than significant****.*

This impact would be the similar to Impact 3.2-1 (Alt. 1) because implementing this alternative would not reduce authorized access in the study area and would not divide an established community. Alternative 4 would involve removing two of the golf course bridges; however, the bridges would be replaced with a new bridge, and the bridges do not provide authorized access through the study area. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-2 (Alt. 4)

Potential Conflict with Land Use Plans, Policies, or Regulations Intended to Protect the Environment. *Alternative 4 would include stabilization of the river in place and only minor changes to the existing golf course. These proposed land uses would be consistent with applicable plans, policies, and regulations intended to protect the environment. This impact would be* ***less than significant****.*

This impact would be similar to Impact 3.2-2 (Alt. 1) because use associated with the existing golf course and other management practices in the study area would be consistent with allowable uses under PAS 119 and where non-confirming uses are not consistent with the TRPA *Regional Plan* this would be a continuation of existing conditions, which predate the *Regional Plan*. Implementing Alternative 4 would not intensify or expand any nonconforming uses. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-3 (Alt. 4)	Potential Conflict with State Parks Plans, Policies, and Regulations. *Stabilization of the river under Alternative 4 would not provide for restoration of the natural character of the river as identified in the Lake Valley SRA General Plan. However, the Lake Valley SRA General Plan would be amended to modify the river protection goals and policies, which would make the proposed land uses in the study area consistent with the Lake Valley SRA General Plan. This impact would be* ***less than significant****.*

Under Alternative 4, the amendment to the General Plan would modify the river protection goals and policies, because the approach under Alternative 4 would not be consistent with the directives of the General Plan for restoring a more natural channel. The text amendments to the Lake Valley SRA General Plan would modify the management approach for the river to policies that reflect stabilization in place and repair of degradation if it occurs and would eliminate language for river restoration. Because the policies would still reflect the overall purpose of management of natural resources at the SRA, this impact would be less than significant.

Alternative 4 would not involve relocating any golf course holes to the west side of the river or other alterations to Washoe Meadow SP; therefore, no changes in the boundaries between Washoe Meadows SP and Lake Valley SRA would be necessary. State Parks has not prepared a general plan for Washoe Meadows SP, and the general plan amendment for Lake Valley SRA would not include plan elements for Washoe Meadows SP. Consistency with a general plan is, therefore, not an issue, because a Washoe Meadows SP plan does not exist. As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.2-1 (Alt. 5)	Potential to Physically Divide an Established Community. *Implementation of Alternative 5 would include decommissioning the existing golf course and restoring the river. The golf course holes on the east side of the river would be removed, and no golf course holes would be relocated to Washoe Meadows SP under this alternative. Although the golf course, including the existing bridges, would be removed, there would be no change to authorized access or connectivity from surrounding communities. Because connectivity to surrounding communities would not be reduced and no established communities would be divided, this impact would be* ***less than significant****.*

This impact would be the similar to Impact 3.2-1 (Alt. 3) because this alternative would not reduce authorized access in the study area and, therefore, would not divide an established community. However, Alternative 5 would not improve access (as proposed under Alternative 2), because it would not include a bridge with authorized public access or a new pedestrian path as would be established under Alternatives 3 and 5. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-2 (Alt. 5) **Potential Conflict with Land Use Plans, Policies, or Regulations Intended to Protect the Environment.** *Proposed land uses under Alternative 5 would be consistent with the permissible land uses of the applicable plans, policies, and regulations intended to protect the environment. This impact would be* ***less than significant****.*

This impact would be similar to Impact 3.2-2 (Alt. 3) because the proposed land uses would be consistent with allowable uses under PAS 119 and the TRPA *Regional Plan*. Implementing Alternative 5 would not intensify or expand any nonconforming uses. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-3 (Alt. 5) **Potential Conflict with State Parks Plans, Policies, and Regulations.** *Implementation of Alternative 5 would include decommissioning the existing golf course and restoring the river. The park unit would be reclassified into a single state park unit with Washoe Meadows SP. . Because Alternative 5 would not involve the development of new facilities, restoration could be implemented without a general plan. This impact would be* ***less than significant****.*

Implementing Alternative 5 would eliminate the existing golf course within Lake Valley SRA. Removal of the golf course and restoration of the area to natural habitat could be implemented without amendments to the general plan, because it would not involve development of any new facilities; however, the primary purpose of the SRA would be eliminated. Consequently, State Parks would revoke the existing Lake Valley SRA General Plan and reclassify the former SRA to become part of a single unit with Washoe Meadows SP. All land of the former SRA would be classified as state park. Maintaining the unit in perpetuity as an ecosystem restoration area with no public access or outdoor recreation use would not be feasible, recognizing the unmet demand for outdoor recreation in the state and the mission of State Parks. In time, some form of planning for and implementation of public access and/or outdoor recreation facilities would need to occur in keeping with the mission of State Parks.

If temporary retention of a 9-hole golf course occurred prior to decommissioning and restoration of the meadow while State Parks restores the river and floodplain and/or considers classification, unit names, future recreation uses, and resource management, the Lake Valley SRA and Washoe Meadows SP boundaries would remain unchanged until a decision was made about the future disposition of the park units. The Public Resources Code does not require amendment of the General Plan to accommodate a nonpermanent use and the golf use is already a part of the general plan, so the temporary use of Lake Valley SRA for a 9-hole golf course could occur under the existing General Plan. No interim management plan would be prepared as part of Alternative 5, because State Parks would complete a more detailed planning process in the future to evaluate alternative uses of the combined units. This would be a separate action subject to its own environmental review under CEQA.

Because retention of a 9-hole golf course would be a temporary use and restoration of Lake Valley SRA would not include any new permanent facilities, designation of this area as a state park would be consistent with State Parks policies and regulations, including the Public Resources Code. This impact would be less than significant.

No mitigation is required.

CONSISTENCY WITH APPLICABLE TRPA GOALS AND POLICIES

Table 3.2-1 identifies Goals and Policies of the TRPA *Regional Plan* applicable to the study area. This table also includes consistency determinations and provides supporting narrative for all alternatives. Alternatives 1 is the No Project/No Action Alternative where many non-conforming uses predate the Regional Plan. Furthermore, several Goals and Policies are related to implementation of a project; therefore, are not relevant to the No Project/No Action Alternative. Alternatives 2 through 5 are action alternatives; therefore, more detailed discussions of how the alternative would be consistent with the Goals and Policies may be provided.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Land Use Goal #1: Restore, maintain, and improve the quality of the Lake Tahoe Region for the visitors and residents of the region.						
Policy 1: The primary function of the region shall be as a mountain recreation area with outstanding scenic and natural values.	Y	Y	Y	Y	Y	Under Alternative 1, the No Project/No Action Alternative, the study area would remain in use as a golf course and an outdoor recreation area within Washoe Meadows SP, which would continue to support recreational uses. All of the action alternatives (Alternatives 2–5) would involve providing recreation opportunities and improving the natural values of the Upper Truckee River within the study area. Alternatives 2, 3, and 5 would also involve reducing coverage within the study area and provide a riparian zone buffer between the river and the golf course. All alternatives would be consistent with TRPA scenic guidelines.
Policy 2: The Regional Plan gives a high priority to correcting past deficiencies in land use. The Plan shall encourage a redirection strategy for substantially and adversely altered areas, wherever feasible.	NA	Y	Y	Y	Y	Alternative 1, the No Project/No Action Alternative, would continue to support recreational uses, but would not modify existing land uses, restore the river or improve the natural character of the area. All of the action alternatives (Alternatives 2–5) would include enhancements that would improve effects of past land use of the Upper Truckee River. Alternatives 2, 3, and 5 would include full geomorphic restoration, providing improved habitat and floodplain function, and implementing Alternative 4 would stabilize the bed and banks of the Upper Truckee River, which would decrease ongoing erosion within the study area.
Policy 3: The Plan shall seek to maintain a balance between economic health and the environment.	NA	Y	Y	Y	Y	Under Alternatives 1 and 4, revenues and taxes would remain unchanged, and no economic impact on the community or State Parks would occur. Under Alternative 1, no restoration would occur, and erosive forces would continue. Under Alternative 4, the river would be stabilized in place. Alternatives 2, 3, and 5 would include full geomorphic restoration, providing improved habitat and floodplain function. Under Alternative 2, there would be slight increases in total revenue that would be considered beneficial to the community, and no adverse economic impacts on State Parks would occur. The economic impact of creating a nontraditional golf course (Alternative 3) or decommissioning the Lake Tahoe Golf Course (Alternative 5) would reduce direct visitor spending and tax revenue, including transient occupancy taxes and property taxes, in the South Shore area. However, this would not be sufficient to alter the balance between economic health and the environment.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Land Use Goal #2: Direct the amount and location of new land uses in conformance with the environmental threshold carrying capacities and other goals of the Tahoe Regional Planning Compact.						
Policy 2: Specific land use policies shall be implemented through the use of planning area statements for each of the planning areas identified in the map included in the Regional Plan. Areas of similar use and character have been mapped and categorized within one or more of the following five land use classifications: conservation, recreation, residential, commercial and public service, and tourist. These land use classifications shall dictate allowable land uses.	Y	Y	Y	Y	Y	The study area is located in PAS 119 (County Club Meadow). Alternatives 1–5 would be consistent with the permissible uses in this PAS.
Policy 3: The Plan Area Statements shall also identify the management theme for each planning area by designating each area for (1) maximum regulation, (2) development with mitigation, or (3) redirection of development. These designations shall provide additional policy direction for regulating land use.	Y	Y	Y	Y	Y	The study area is designated as a "development with mitigation" area which is for areas that can accommodate additional development with mitigation of impacts where land is capable of withstanding the use. Implementing Alternative 1, 3, 4, or 5 would either maintain or reduce existing development. Implementing Alternative 2 would move some golf course holes west of the river to higher capability lands in Washoe Meadows SP; however, much of this area was previously disturbed by a historical quarry, roads, and trails.
Policy 4: The Plan Area Statements set forth special policy direction to respond to the particular need, problems, and future development of a specific area. Each Planning Area Statement may vary in detail or specificity depending on the nature of the area and the detail or specificity related to local jurisdictional plans.	Y	Y	Y	Y	Y	The study area is located in PAS 119 (County Club Meadow). Alternatives 1–5 would be consistent with the permissible uses in this PAS.
Policy 5: All plan area statements, community plans, or other specific plans adopted by the agency shall specify the total additional development which may be permitted within the region, not to exceed the limitations set forth in A, B, C, D, and E in	Y	Y	Y	Y	Y	None of the alternatives (Alternatives 1 – 5) would include additional residential, commercial, tourist accommodation, or public service development. Therefore, these uses would not be increased under any of the alternatives. In addition, implementation of Alternative 1, 3, 4, or 5 would result in either no change or a decrease in recreation development. Alternative 2 would involve recreation development in the study area; however, this would be reconstruction

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
the Regional Plan. Reconstruction and relocation of existing development are not considered additional development.						of existing recreation development and would not be considered additional development.
Policy 11: Uses of the bodies of water within the region shall be limited to outdoor water-dependent uses required to satisfy the goals and policies of this plan.	Y	Y	Y	Y	Y	The portion of the Upper Truckee River within the study area would continue to be used for informal water-related recreation under all of the alternatives.
Land Use Goal #3: All new development shall conform to the coefficients of allowable land coverage as set forth in "The Land Capability Classification of the Lake Tahoe Basin, California-Nevada, a Guide for Planning, Bailey, 1974."						
Policy 1: Allowed base land coverage for all new projects and activities shall be calculated by applying the Bailey coefficients, as shown below, to the applicable area within the parcel boundary. Land Capability District — Max Allowable Coverage 1a — 1% 1b — 1% 1c — 1% 2 — 1% 3 — 5% 4 — 20% 5 — 25% 6 — 30% 7 — 30%	NA	Y	Y	Y	Y	Existing coverage within the study area exceeds that allowed by applying the Bailey coefficients for LCDs 1b and 1c. This coverage was existing pre-1972 and pre-dates the Regional Plan and is, therefore, considered grandfathered use. However, much of this coverage would be removed and/or relocated to higher capability and previously disturbed lands within the study area under Alternatives 2, 3, and 5. Coverage within higher capability lands would be consistent with that allowed by applying the Bailey Coefficient or as allowed by relocating covering to provide net environmental benefit, consistent with Regional Plan Goals and Policies. Alternative 1 would not include any changes in coverage. Alternative 2, 3, and 5 decrease coverage located in 1b (SEZ) and coverage within other land capabilities is consistent with that allowed on-site. Alternative 4 would have only a minor increase in coverage in 1brelated to the proposed restroom facility; however, this coverage is consistent with that allowed on-site. Banked coverage credit would be used for any coverage exceedences. See section 3.6 "Earth Resources" for additional coverage discussion.
Policy 2: The allowed coverage in Policy 1 may be increased by transfer of land coverage within hydrologically related areas up to the limits as set for the in A, B, C, D, and F of this policy.	NA	Y	Y	Y	Y	See Land Use Goal #3, Policy 1 above.
Policy 3: Rehabilitation, reconstruction, and upgrading of the existing inventory of structures, or other forms of coverage in the Tahoe region, are high priorities of the Regional Plan. To encourage rehabilitation	NA	Y	Y	Y	Y	See Land Use Goal #3, Policy 1 above.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
and upgrading of structures, the policies listed under this policy shall apply						
Land Use Goal #4: Provide to the greatest possible extent, within the constraints of the environmental threshold carrying capacities, a distribution of land use that ensures the social, environmental, and economic well-being of the region.						
Policy 1: All persons shall have the opportunity to use and enjoy the region's natural resources and amenities.	Y	Y	Y	Y	Y	Under all of the alternatives, the study area would be managed and available for the public to use and enjoy recreation and natural resources. The northern portion of Washoe Meadows SP would remain undeveloped, and informal recreation such as hiking and fishing would continue within Washoe Meadows SP and along much of the river under all alternatives, which would be consistent with Special Policies 6 and 10 of PAS 119.
Policy 2: No person or persons shall develop property so as to endanger the public health, safety, and welfare.	Y	Y	Y	Y	Y	Construction of the action alternatives would likely involve the use of hazardous materials, such as fuels and other materials, but this would be temporary, and all materials would be used in accordance with applicable Federal, State, and local laws, including California Occupational Safety and Health Administration (Cal-OSHA) requirements and manufacturers' instructions. No alternatives would involve constructing any buildings for human occupancy, and no buildings would be demolished as part of any of the alternatives. No alternatives would increase risk of wildland fire, hazards to aviation, or mosquito vector control after mitigation. For these reasons, implementing any of Alternatives 1–5 would not endanger public health, safety, or welfare.
Noise Goal #1: Single-event noise standards shall be attained and maintained.						
Policy 3: Motor vehicles and motorcycles shall comply with the appropriate noise thresholds.	Y	Y	Y	Y	Y	As discussed in Section 3.12, "Noise," construction traffic under all of the alternatives (Alternatives 1—5) would comply with appropriate noise thresholds. None of the alternatives would result increases in noise related to operation.
Policy 4: Off-road vehicle use is prohibited in the Lake Tahoe region except on specified roads, trails or designated areas where the impacts can be mitigated.	Y	Y	Y	Y	Y	Public off-road vehicle use would not be allowed within the study area under any of the alternatives, with the exception of continued snowmobile use on a track within the driving range operated by a concessionaire under Alternatives 1 through 4 or would be eliminated under Alternative 5. State Parks personnel would continue to use snowmobiles and other equipment for management access, as needed, and monitor for unauthorized snowmobile use under all of the alternatives.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Policy 5: The use of snowmobiles will be restricted to designated areas.	Y	Y	Y	Y	Y	No changes to snowmobile activities would occur under Alternatives 1–4. Snowmobiling would continue to take place during the winter months, would continue to be operated by an independent vendor, and would continue to abide by all necessary operating permits and their conditions. Under Alternative 5, snowmobile operations would cease.
Policy 6: The plan will permit uses only if they are consistent with the noise standards. Sound proofing practices may be required on all structures containing uses that would otherwise adversely impact the prescribed noise levels.	Y	Y	Y	Y	Y	Under all alternatives, noise levels created by project activities would be consistent with applicable noise standards established by the TRPA and El Dorado County. No standards would be exceeded at sensitive receptors, and no new sensitive receptors would be created.
Natural Hazards Goal #1: Risks from natural hazards (e.g., flood, fire, avalanche, earthquake) will be minimized.						
Policy 2: Prohibit construction, grading, and filling of lands within the 100-year floodplain and in the area of wave run-up, except as necessary to implement the goals and policies of the plan. Require all public utilities, transportation facilities, and other necessary public uses located in the 100-year floodplain and area of wave run-up to be constructed or maintained to prevent damage from flooding and to not cause flooding.	NA	Y	Y	Y	Y	The proposed project is not located within the area of wave run-up (i.e., it is not adjacent to Lake Tahoe). Under Alternative 1, existing fill, infrastructure, and public uses within the 100-year floodplain would remain. Expected river dynamics under Alternative 1 would increase the risks of flood damage to public infrastructure crossing under or aligned near the eroding riverbanks. However, State Parks would address bridge replacement and bank failures on an as-needed basis. The action alternatives (Alternatives 2–5) would include temporary grading and construction within the 100-year floodplain, but they would produce long-term improvements in risks from flooding. Alternatives 2, 3, and 5 would involve removing existing fill in the floodplain and decreasing the intensity of public uses within the most sensitive areas within the 100-year floodplain. All of the action alternatives would involve improving the protection of buried utilities under the river and close to the river against flood damage. Where floodplain modifications are proposed mitigation has been put in place to prevent potential damage from and not to cause flooding.
Policy 3: Inform residents and visitors of the wildfire hazard associated with occupancy in the basin, encourage use of fire resistant materials and preventative techniques when constructing structures, especially in the highest fire hazard areas. Manage forest fuels to be consistent with state laws and other	Y	Y	Y	Y	Y	No habitable structures are proposed under any alternative. As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA and Washoe Meadows SP. The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas. The Lake Tahoe Golf Course is responsible for general vegetation maintenance and relies on State Parks to

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
goals and policies of this plan.						remove hazardous trees. Crews regularly assemble dead, fallen, and otherwise hazardous vegetation for removal. The wildfire management plan would continue to be implemented under all alternatives.
Water Quality Goal #1: Reduce loads of sediment and algal nutrients to Lake Tahoe; meet sediment and nutrient objectives for tributary streams, surface runoff, and subsurface runoff, and restore 80% of the disturbed lands.						
Policy 2: All persons who own land and all public agencies that manage public lands in the Lake Tahoe region shall put BMPs in place; maintain their BMPs; protect vegetation on their land from unnecessary damage; and restore the disturbed soils on their land.	Y	Y	Y	Y	Y	Existing facilities' best management practices (BMPs) would be maintained under Alternative 1. Spot stabilization would continue to occur along the river where needed. However, golf course uses would also continue to be adjacent to the river. Under all of the action alternatives (Alternatives 2–5), any new or modified facilities would have appropriately designed BMPs installed and maintained. All action alternatives would reduce disturbed soils and protect/improve vegetation along the Upper Truckee River by either geomorphic restoration or stabilization and biotechnical treatments. Additionally, Alternative 2 would include restoration of disturbed soils west of the river.
Policy 3: Application of BMPs to projects shall be required as a condition of approval for all projects.	NA	Y	Y	Y	Y	Alternative 1 is the No Project/No Action Alternative; therefore, no conditional approvals are needed. However, any future management activities under Alternative 1 would comply with potential BMP requirements. All of the action alternatives (Alternatives 2–5) would require implementation of temporary and permanent BMPs as appropriate.
Policy 4: Restore at least 80 percent of the disturbed lands within the region.	NA	Y	Y	NA	Y	Implementation of either Alternative 1 or 4 would not result in restoration of lands within the study area; however, these alternatives would result in continuation of existing land use conditions and would not change the consistency of land uses in the study area related to this policy. Alternative 2 would require disturbance of some existing habitat and some previously disturbed lands; however, it would ultimately result in restoration of 37 acres of SEZ lands that and would be consistent with this policy. Implementation of either Alternative 3 or 5 would include restoration of lands including SEZ and would be consistent with this policy.
Policy 6: The use of fertilizer within the Tahoe region shall be restricted to uses, areas, and practices identified in the handbook of best management practices. Fertilizers shall not be used in or near stream	Y	Y	Y	Y	Y	Existing fertilizer use within the golf course would not be modified under Alternative 1, which includes some areas of intensively managed landscaping immediately adjacent to the Upper Truckee River, Angora Creek, and the unnamed stream. Leaving the golf course adjacent to the river would have a higher risk of water quality degradation than moving the golf course away

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
and drainage channels, or in stream environment zones, including setbacks, and in shorezone areas. Fertilizer use for maintenance of preexisting landscaping shall be minimized in stream environment zones and adjusted or prohibited if found, through evaluation of continuing monitoring results, to be in violation of applicable water quality discharge and receiving water standards.						from the river, but monitoring to date has not documented violation of applicable water quality discharge and receiving water standards. Alternative 4 would retain similar or slightly improved buffer distances between the waterways and the intensively managed landscaping, and fertilizer use would continue to be monitored and evaluated. Under Alternatives 2 and 3, areas fertilized and fertilizer practices would be updated to fit the revised golf course layout, modified turf management categories, and improved irrigation and drainage system. These measures would decrease the risks of water quality degradation, and fertilizer use would continue to be monitored and evaluated. Under Alternative 5, fertilizer use would be discontinued throughout the existing golf course area, but a limited area of landscaping near the clubhouse and parking facility would remain. This would substantially decrease the risks of water quality degradation related to fertilizer use.
Policy 7: Off-road vehicle use is prohibited in the Lake Tahoe region except on specified roads, trails, or designated areas where the impacts can be mitigated.	Y	Y	Y	Y	Y	See noise Goal #1, Policy 4.
Policy 8: Transportation and air quality measures aimed at reducing airborne emissions of oxides of nitrogen in the Tahoe Basin shall be carried out.	Y	Y	Y	Y	Y	As discussed in Section 3.11, “Air Quality,” Alternative 1 would not result in temporary or long-term increase in air quality pollutants. In addition, measures would be implemented under Alternative 2, 3, 4, and 5 that would reduce the generation of construction-related emissions of ROG, NO_X, and PM_{10} to a less-than-significant level. None of the alternatives would result in a significant increase in long-term emissions.
Water Quality Goal #2: Reduce or eliminate the addition of other pollutants that affect, or potentially affect, water quality in the Tahoe Basin.						
Policy 1: All persons engaging in public snow disposal operations in the Tahoe region shall dispose of snow in accordance with site management criteria and management standards in the handbook of best management practices.	Y	Y	Y	Y	Y	All alternatives would dispose of snow in accordance with site management criteria and management standards in the handbook of best management practices. Alternatives 1and 3 would continue snow disposal operations as they occur today under existing conditions. Alternatives 2 and 4 would include additional snow removal in the area just north of the golf course entrance proposed to be paved (described in Chapter 2, “Project Alternatives.”) and Alternative 5 snow removal activities would either continue as under existing conditions or, if needed, be modified based on proposed land uses to be evaluated under a separate planning process.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Policy 3: No person shall discharge solid wastes in the Lake Tahoe region by depositing them on or in the land, except as provided by TRPA Ordinance.	NA	Y	Y	Y	Y	As discussed in Sections 3.13 “Public Services and Utilities” and “Geomorphology and Water Quality” mitigation measures have be put in place under all action alternatives that include consultation with STPUD prior to construction and protection or relocation of existing sewer lines within the study area to avoid potential water quality impacts related to sewage spills. Alternative 1 does not include construction activities and would, therefore, not affect sewer lines.
Policy 6: TRPA shall coorperate with other agencies with jurisdiction in the Lake Tahoe Region in preparation, evaluation, and implementation of toxic and hazardous spill control plans.	Y	Y	Y	Y	Y	Current toxic and hazardous spill control plans are in place and would continue to be used under Alternative 1. If necessary, plans would be updated through consultation with appropriate agencies (e.g., Lahontan RWQCB or El Dorado County).
Policy 9: Evaluate the feasibility and effectiveness of ponding facilities along stream corridors as a strategy for removing instream loads of sediment and nutrients.	NA	Y	Y	Y	Y	Alternative 1 would not include options for treating instream loads of sediment and nutrients by off-channel ponding or settling; however, this alternative would be a continuation of existing conditions and would not result in new actions that would be inconsistent with this policy. Implementing Alternative 2, 3, or 5 would increase the opportunity, frequency, and areas of potential floodplain trapping of sediment and nutrients, including the possible incorporation of recontoured existing ponds. The stabilization of the river for Alternative 4 would also reduce sediment loads; however, after consideration of the feasibility of increasing effective off-stream ponding, it would be impractical because the golf course would remain adjacent to the river channel.
Community Design Goal #1: Ensure preservation and enhancement of the natural features and qualities of the region, provide public access to scenic views, and enhance the quality of the built environment.						
Policy 1: The scenic quality ratings established by the environmental thresholds shall be maintained or improved.	Y	Y	Y	Y	Y	As discussed in Section 3.7, “Scenic Resources,” Alternatives 1–5 would comply with scenic quality standards for TRPA, including TRPA’s Scenic Resource Thresholds identified in TRPA’s Code of Ordinances and TRPA’s Design Review Guidelines.
Policy 2: Restoration programs based on incentives will be implemented in those areas designated in need of scenic restoration to achieve the recommended rating.	Y	Y	Y	Y	Y	The study area is designated as a Scenic Restoration Area. As discussed in Section 3.7, “Scenic Resources,” Alternatives 1, 3, and 4 would not modify the scenic quality of the study area. Alternative 2 would include mitigation measures to protect the scenic quality of the study area and Alternative 5 would improve the scenic quality of the study area by removing the golf

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
						course.
Community Design Goal #2: Regional building and community design criteria shall be established to ensure attainment of the scenic thresholds, maintenance of desired community character, compatibility of land uses, and coordinated project review.						
Policy 1: Regional design review shall include site design, building height, bulk and scale, landscaping, lighting, and signing to be used in evaluating projects throughout the region. This review may entail additional requirements or special requirements not listed above.	NA	Y	Y	Y	Y	As discussed in Section 3.7, “Scenic Resources,” Alternatives 1–5 would comply with scenic quality standards for TRPA, including TRPA’s Scenic Resource Thresholds identified in TRPA’s Code of Ordinances and TRPA’s Design Review Guidelines. While Alternative 1 is consistent with scenic standards, it would not include any review or special requirements.
Transportation Objective 4: Develop and encourage the use of pedestrian and bicycle facilities as a safe and viable alternative to automobile use.						
Policy A: There shall be a high priority on constructing pedestrian and bicycle facilities in urbanized areas of the Region and where reductions in congestion will result.	Y	Y	Y	Y	Y	Implementing Alternative 1, 4, or 5 would not result in any permanent changes to pedestrian and bicycle facilities; however, volunteer trails in Washoe Meadows SP and the existing segment of separated bicycle trail along the Lake Valley SRA frontage on U.S. 50 provide substantial pedestrian and bicycle opportunities. Alternative 2 includes new designated trails that tie the informal dispersed recreation trails on the west side of the river to new trails on the east side of the river via the new bridge. Alternatives 2 and 3 include two designated trails on the east side of the river. The first would tie into the new Sawmill Bike Path, and the second would extend to the south and tie into the corner of Country Club Drive and Bakersfield Street.
Policy B: Pedestrian and bicycle facilities shall be constructed, or upgraded, and maintained along major travel routes.	Y	Y	Y	Y	Y	See Transportation Objective #4, Policy B. Furthermore, as discussed in Section 3.10, “Traffic,” implementing any of Alternatives 2–5 that could affect existing trails due to construction truck traffic would include mitigation to correct damage to the trails.
Policy E: Bicycle and pedestrian linkages shall be provided between residential and non-residential areas.	Y	Y	Y	Y	Y	See Noise Goal #1, Policy 4.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Vegetation Goal #1: Provide for a wide mix and increased diversity of plant communities in the Tahoe Basin.						
Policy 1: Forest management practices shall be allowed when consistent with acceptable strategies for the maintenance of forest health and diversity, prevention of fire, protection of water quality, and enhancement of wildlife habitats.	Y	Y	Y	Y	Y	As discussed in Section 3.5, "Biological Resources," Alternatives 1–5 would comply with vegetation standards for TRPA, including TRPA's thresholds for vegetation identified in TRPA's Code of Ordinances, and with TRPA's Design Review Guidelines. Forest management practices will be consistent with acceptable strategies for the maintenance of forest health and diversity, prevention of fire, protection of water quality, and enhancement of wildlife habitats.
Policy 2: Opportunities to improve the age structure of the pine and fir plant communities shall be encouraged when consistent with other environmental considerations.	Y	Y	Y	Y	Y	As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA and Washoe Meadows SP. The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas. The Lake Tahoe Golf Course is responsible for general vegetation maintenance and relies on State Parks to remove hazardous trees. Crews regularly assemble dead, fallen, and otherwise hazardous vegetation for removal. The wildfire management plan would continue to be implemented under all alternatives.
Policy 4: Edge zones between adjacent plant communities will be maximized and treated for their special value relative to plant diversity and wildlife habitat.	Y	Y	Y	Y	Y	Alternative 1 would not result in any improvements in valuable plant communities and wildlife habitat; however, State Parks would continue to manage the study area as occurs under existing conditions, with fuels management and spot treatments along the river. Existing fuels management practices would improve edge zones between adjacent plant communities, especially in locations where meadow encroachment has occurred. Golf course landscaping would continue to be located adjacent to the Upper Truckee River. However, this alternative would be a continuation of existing conditions and would not result in new conditions that would be inconsistent with this policy. Alternatives 2, 3, and 5 would remove golf landscape from areas adjacent to the Upper Truckee River improving plant diversity and wildlife habitat. Alternative 4 would stabilize the river in place and add biotechnical treatments along the river's edge also improving plant and wildlife diversity; however to a lesser extent than Alternatives 2, 3, and 5.
Policy 5: Permanent disturbance or unnecessary alteration of natural vegetation associated with development activities shall not exceed the approved boundaries [or	NA	Y	Y	Y	Y	Under Alternative 1, no new disturbance is proposed; however, vegetation disturbance along the river banks will continue to occur. Under each of the alternatives, permanent disturbance or unnecessary alteration of natural vegetation associated with development activities shall be minimized. Under

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
footprints] of the building, driveway, or parking structures, or that which is necessary to reduce the risk of fire or erosion.						Alternative 2, much of the area proposed to become golf course west of the river is on previously disturbed lands where implementation of this alternative can reduce erosion sources within this area. Mitigation Measures 3.5-5 and 3.5-7 are actions to minimize and mitigate short-term disturbance of natural vegetation.
Policy 8: Revegetation of disturbed sites shall require the use of species approved by the agency. TRPA shall prepare specific policies designed to avoid the unnecessary use of landscaping which requires long-term irrigation and fertilizer use.	Y	Y	Y	Y	Y	Implementing Alternative 1 would not result in the creation of any new disturbed areas. Uses of irrigation and fertilizer would not be modified under Alternative 1 or 4. Existing fertilizer use is limited to critical areas and monitoring results have not identified water quality issues related to these uses. Under Alternatives 2–5, revegetation of restored area would involve use of salvage materials (sod and willow clumps), when available, and plant species native to the area. Alternative 2 would involve essentially swapping more sensitive areas adjacent to the river where golf landscape currently exists for higher capability previously disturbed lands for golf development. Furthermore, irrigation and drainage would be upgraded and additional BMPs and buffer areas installed. Fertilizer use would be similar to use under existing conditions, except buffer areas would decrease the potential for water quality impacts related to fertilizer use. Implementing Alternative 3 would decrease golf landscape adjacent to the river, similar to Alternative 2, and decrease irrigation and fertilizer use. Under Alternative 5, fertilizer use would be discontinued throughout the existing golf course area, but a limited area of landscaping near the clubhouse and parking facility would remain.
Policy 9: All proposed actions shall consider the cumulative impact of vegetation removal with respect to plant diversity and abundance, wildlife habitat and movement, soil productivity and stability, and water quality and quantity.	Y	Y	Y	Y	Y	Section 3.16, “Cumulative,” considers the cumulative impacts of vegetation removal with respect to plant diversity and abundance, wildlife habitat and movement, soil productivity and stability, and water quality and quantity for Alternatives 1–5.
Vegetation Goal #2: Provide for the maintenance and restoration of such unique eco-systems as wetlands, meadows, and other riparian vegetation.						
Policy 1: Riparian plant communities shall be managed for the beneficial uses of passive recreation, groundwater recharge, and	Y	Y	Y	Y	Y	Alternative 1 could involve continued riparian degradation to occur where bank erosion takes place; however, emergency streambank repairs would be implemented to the extent feasible and existing riparian habitat would be

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
nutrient catchment, and as wildlife habitats.						managed for beneficial uses, consistent with the State Parks mission. Groundwater recharge, nutrient catchment, and wildlife habitats would continue to be limited by steep erosive banks along the Upper Truckee River. Alternatives 1, 3, and 5 would improve those functions described above by establishing a more geomorphically functioning channel that allows for improved, groundwater recharge, nutrient catchment, and wildlife habitats. By taking most golf course uses away from the river will also allow for improved access to the river for passive recreational uses. Alternative 4 will decrease existing bank erosion by stabilization of the banks and somewhat improve wildlife habitat conditions by the addition of biotechnical treatments; however, groundwater recharge will still be somewhat limited by the disconnected floodplain and golf course uses will continue to be adjacent to the Upper Truckee River.
Policy 2: Riparian plant communities shall be restored or expanded whenever and wherever possible.	NA	Y	Y	Y	Y	Under Alternative 1, the riparian area would continue to exist in its current degraded state; however, this alternative would be a continuation of existing conditions and would not result in new conditions that would be inconsistent with this policy. Under any of Alternatives 2–5, riparian plant communities would be restored and expanded.
Vegetation Goal #3: Conserve threatened, endangered, and sensitive plant species and uncommon plant communities of the Lake Tahoe basin.						
Policy 1: Uncommon plant communities shall be identified and protected for their natural values.	Y	Y	Y	Y	Y	No construction is proposed under Alternative 1. However, if spot treatments need to occur along the banks of the Upper Truckee River State Parks will protect uncommon plant communities, as current management practices do. Alternatives 2–5 include preconstruction surveys for special-status plant species and Alternative 2, which is the only alternative that proposes activity in the vicinity of the fen in Washoe Meadows SP, specifies measures to avoid and minimize impacts on this resource.
Policy 2: The population sites and critical habitat of all sensitive plant species in the Lake Tahoe basin shall be identified and preserved.	Y	Y	Y	Y	Y	Sensitive plant species may occur on the project site, based on assessment of existing habitats. Pre-construction surveys would be conducted prior to any disturbance to confirm absence of sensitive plant species. If occurrences of sensitive plant species were found, those individuals would be clearly identified and avoided during construction or other appropriate actions to compensate for the effect would be implemented.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Wildlife Goal #1: Maintain suitable habitats for all indigenous species of wildlife without preference to game or nongame species through maintenance of habitat diversity.						
Policy 1: All proposed actions shall consider impacts to wildlife.	NA	Y	Y	Y	Y	No action would occur under Alternative 1. Potential direct, indirect, and cumulative impacts on common and sensitive wildlife resources related to implementation of Alternatives 1–5 were evaluated. Mitigation measures are proposed where necessary to reduce potential impacts to less-than-significant levels.
Policy 2: Riparian vegetation shall be protected and managed for wildlife.	Y	Y	Y	Y	Y	Alternative 1 would allow for continued riparian degradation to occur. Wildlife habitats would continue to be limited by steep erosive banks along the Upper Truckee River however, emergency streambank repairs would be implemented to the extent feasible and existing riparian habitat would be managed for beneficial uses, consistent with the State Parks mission. Alternatives 1, 3, and 5 would improve wildlife habitat by establishing a more geomorphically functioning channel and improve riparian corridor. By taking most golf course uses away from the river will also allow for improved access to the river. Alternative 4 will decrease existing bank erosion by stabilization of the banks and somewhat improve wildlife habitat conditions by the addition of biotechnical treatments; however, the corridor will still be somewhat limited by the golf course uses adjacent to the Upper Truckee River.
Wildlife Goal #2: Preserve, enhance, and, where feasible, expand habitats essential for threatened, endangered, rare, or sensitive species found in the basin						
Policy 1: Endangered, threatened, rare, and special interest species shall be protected and buffered against conflicting land uses.	Y	Y	Y	Y	Y	Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented, and habitat for special-status plant and wildlife species would remain the same as the existing conditions. Golf course would continue to exist adjacent to the Upper Truckee River and existing riparian vegetation would continue to be limited by steep erosive banks. Under any of Alternatives 2–5, special-status wildlife species would be protected during construction activities by implementing mitigation measures as described in Section 3.5, "Biological Resources." These measures require preconstruction surveys and protection of active breeding sites of special-status wildlife species that could be affected during construction. Over the long term, ecosystem response to river and floodplain restoration under any of Alternatives 2–5 is expected to improve habitat quality and functions for riparian and aquatic wildlife, including waterfowl and special-status species such as yellow warbler, willow flycatcher. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
						wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). This would be a beneficial effect on common and special-status wildlife associated with riparian, wetland, and aquatic habitat and wildlife habitats of special significance. Under Alternative 2, relocating golf course holes would remove and fragment upland habitat and slightly increase disturbance levels west of the Upper Truckee River. The bridge access and new trail at the north end of the new reconfigured golf course could facilitate increased access of Washoe Meadows SP to the west and affect common wildlife species. However, golf course reconfiguration and trail development proposed under Alternative 2 are not expected to substantially affect breeding productivity or population viability of any common or special-status wildlife or cause a change in species diversity locally or regionally. Furthermore, much of this area was previously disturbed by quarry uses, voluntary trails, and access roads.
Fisheries Goal #1: Improve aquatic habitat essential for the growth, reproduction, and perpetuation of existing and threatened fish resources in the Lake Tahoe basin.						
Policy 2: Unnatural blockages and other impediments to fish movement will be prohibited and removed wherever appropriate.	Y	Y	Y	Y	Y	None of the alternatives would involve creating unnatural blockages or other impediments to fish movement and none currently exist within the study area.
Policy 5: Habitat improvement projects are acceptable practices in streams and lakes.	NA	Y	Y	Y	Y	Under Alternative 1, the No Project/No Action Alternative, the habitat conditions in the Upper Truckee River in the study area would continue to be affected by periodic treatments applied to eroding banks to prevent loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced if needed. The condition of aquatic habitats would remain similar relative to the existing, degraded condition. Implementing any of the action alternatives (Alternatives 2–5) would improve fish habitat conditions in the Upper Truckee River within the study area.
Soils Goal #1: Minimize soil erosion and the loss of soil productivity.						
Policy 1: Allowable impervious land coverage shall be consistent with the threshold for impervious land coverage.	Y	Y	Y	Y	Y	See Land Use Goal #3, Policy 1.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Policy 2: No new land coverage or other permanent disturbance shall be permitted in land capability districts 1-3 except for those uses noted in A, B, and C, under this policy.	NA	Y	Y	Y	Y	See Land Use Goal #3, Policy 1.
Policy 6: Grading, filling, clearing of vegetation (that disturbs soil), or other disturbances of the soil are prohibited during inclement weather and for the resulting period when the site is covered with snow or is in a saturated, muddy, or unstable condition, special regulations and construction techniques will apply to all construction activities occurring from October 15 to May 1.	Y	Y	Y	Y	Y	All of the alternatives would comply with seasonal and weather restrictions on any construction activities.
Policy 7: All existing natural functioning SEZs shall be retained as such and disturbed SEZs shall be restored whenever possible.	Y	Y	Y	Y	Y	Alternative 1 could involve continued SEZ degradation to occur where bank erosion takes place; however, emergency streambank repairs would be implemented to the extent feasible and existing riparian habitat would be managed for beneficial uses, consistent with the State Parks mission. Implementing Alternative 4 would not expand or improve the existing SEZ, but it would preserve the existing status and minimize further degradation to the extent feasible. Implementing Alternative 2, 3, or 5 would restore previously disturbed SEZ.
Scenic Goal #1: Maintain and restore the scenic qualities of the natural appearing landscape.						
Policy 1: All proposed development shall examine impacts to the identified landscape view from roadways, bicycle paths, public recreation areas, and Lake Tahoe.	NA	Y	Y	Y	Y	Section 3.7, “Scenic Resources,” analyzes the project’s effects on scenic resources, including views from roadways, bicycle paths, and public recreation areas. Implementing Alternative 1, 3, 4, or 5 would result in less-than-significant impacts on the scenic quality and views from U.S. 50, public recreation areas, bicycle paths, and the surrounding area. In addition, Alternative 2, with implementation of mitigation measures would result in less-than-significant impacts on the scenic quality and views from U.S. 50, public recreation areas, bicycle paths, and the surrounding area.
Policy 2: Any development proposed in areas targeted for scenic restoration or within a unit highly sensitive to change shall	NA	Y	Y	Y	Y	Section 3.7, “Scenic Resources,” analyzes the project’s effects on scenic resources, including views from roadways. Implementing Alternative 1, 3, 4, or 5 would result in less-than-significant impacts on the scenic quality and views

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
demonstrate the effect of the project on the 1982 Travel Route Ratings of the Scenic Thresholds.						from U.S. 50 and would not degrade Roadway Travel Unit 36B. In addition, Alternative 2, with implementation of mitigation measures would result in less-than-significant impacts on the scenic quality and views from U.S. 50 and would not degrade Roadway Travel Unit 36B.
Policy 3: The factors or conditions that contribute to scenic degradation in identified areas need to be recognized and appropriately considered in restoration programs to improve scenic quality.	NA	Y	Y	Y	Y	See Scenic Goal #1, Policy 1 above.
Open Space Goal #1: Manage areas of open space to promote conservation of vegetation and protection of watersheds.						
Policy 1: Management practices in open space that provide for the long term health and protection of the resource(s) shall be permitted when consistent with the other goals and policies of this plan.	N	Y	Y	Y	Y	Under Alternative 1, continued channel instability would continue the degraded function of the river within the study area. State Parks would continue to repair the river by periodic treatments applied to eroding banks to prevent loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced if needed. The condition of aquatic habitats and geomorphic functions would remain similar relative to the existing, degraded condition. Implementing Alternative 4 would not expand or improve the existing SEZ or geomorphic function, but it would preserve the existing status and prevent further degradation. Fish habitat would improve slightly. The golf course would continue to be located adjacent to the river, and the floodplain function would not improve. Implementing Alternative 2, 3, or 5 would restore previously disturbed SEZ, improve floodplain function, and increase habitat by implementing geomorphic restoration of the Upper Truckee River. Implementing Alternative 2 would include golf course use west of the river; however, much of this area was previously disturbed by quarries, volunteer trails, and access roads.
Stream Environment Zone Goal #1: Provide for the long-term preservation and restoration of stream environment zones.						
Policy 1: Restore all disturbed stream environment zone lands in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been disturbed, developed, or subdivided.	NA	Y	Y	Y	Y	Under Alternative 1, no restoration of the disturbed SEZ would occur; however, emergency streambank repairs would be implemented to the extent feasible. There would be no change in existing conditions that would cause inconsistencies with this policy. Implementing Alternative 4 would not expand or improve the existing SEZ,

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
						but it would preserve the existing status and prevent further degradation. Further restoration would not be feasible while maintaining the current the golf course design. Implementing Alternative 2, 3, or 5 would restore previously disturbed SEZ. See Chapter 2, “Project Alternatives,” for acreage information.
Policy 2: SEZ lands shall be protected and managed for their natural values.	Y	Y	Y	Y	Y	Alternative 1 could involve continued SEZ degradation to occur where bank erosion takes place; however, emergency streambank repairs would be implemented to the extent feasible and existing riparian habitat would be managed for beneficial uses, including natural values, consistent with the State Parks mission. Implementing Alternative 4 would not expand or improve the existing SEZ, but it would preserve the existing status and prevent further degradation. The golf course landscape would continue to be located adjacent to the river, within primarily SEZ under both alternatives. Implementing Alternative 2, 3, or 5 would restore previously disturbed SEZ. See Chapter 2, “Project Alternatives,” for acreage information.
Policy 4: Golf courses in stream environment zones shall be encouraged to retrofit course design in combination with fertilizer application standards (see water quality subelement, Goal #1, Policy 5) to prevent release of nutrients to adjoining ground and surface waters.	Y	Y	Y	Y	NA	Under Alternative 1 and 4, the course design would continue as it is today; however, the existing operation includes fertilizer management to protect water quality. Alternatives 2 and 3 would involve retrofitting course design to increase streamside buffers and reduce the area of golf course within SEZ. Current approved fertilizer practices would continue under Alternatives 1 - 4. Under Alternative 5, golf course uses would be discontinued.
Policy 5: No new land coverage or other permanent land disturbance shall be permitted in stream environment zones except for those uses as noted in A, B, C, D and E under this policy.	Y	Y	Y	Y	Y	See Land Use Goal #3, Policy 1.
Policy 6: Replacement of existing coverage in stream environment zones may be permitted where the project will reduce impacts on stream environment zones and will not impede restoration efforts.	NA	Y	Y	Y	Y	See Land Use Goal #3, Policy 1.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Cultural Goal #1: Identify and preserve sites of historical, cultural, and architectural significance within the region.						
Policy 1: Historical or culturally significant landmarks in the Basin shall be identified and protected from indiscriminate damage or alteration.	Y	Y	Y	Y	Y	Section 3.9, "Cultural Resources," analyzes the project's effects on recorded and presently undocumented cultural resources potentially stemming from proposed golf course construction and operation. Implementation of mitigation measures would result in impacts on cultural sites, features, and artifacts and on human remains being reduced to less than significant under all of the proposed alternatives.
Policy 2: Sites and structures designated as historically, culturally, or archaeologically significant shall be given special incentives and exemptions to promote the preservation and restoration of such structures and sites.	Y	Y	Y	Y	Y	Section 3.9, "Cultural Resources," analyzes the project's effects on recorded and presently undocumented cultural resources potentially stemming from proposed golf course construction and operation. Implementation of mitigation measures would result in impacts on cultural sites, features, and artifacts and on human remains being reduced to less than significant under all of the proposed alternatives.
Dispersed Recreation Goal #1: Encourage opportunities for dispersed recreation when consistent with environmental values and protection of the natural resources.						
Policy 1: Low density recreational experiences shall be provided along undeveloped shorelines and other natural areas, consistent with the tolerance capabilities and character of such areas.	Y	Y	Y	Y	Y	Implementing any of the alternatives would provide for low-density recreation within the study area and along the Upper Truckee River. The northern portion of Washoe Meadows SP would remain undeveloped, and informal recreation would continue within Washoe Meadows SP and along the river under all alternatives.
Policy 3: Trail systems for hiking and horseback riding shall be expanded to accommodate projected demands and provide a link with major regional or interstate trails.	NA	Y	Y	Y	Y	Informal trails would be maintained within Washoe Meadows SP under all alternatives. In addition, Alternatives 2 and 3 would include construction of additional trails that would connect to the Sawmill Bike Trail and the corner of Country Club Drive and Bakersfield Street. No officially designated trails would be removed as part of any of the alternatives.
Policy 4: Existing trails that are either underutilized or located in environmentally sensitive areas shall be relocated to enhance their use and to protect natural resources.	Y	Y	Y	Y	Y	Under Alternatives 2 and 3, informal trails located adjacent to the river would be relocated and managed as designated trails. Under Alternatives 1, 4, and 5, informal trails would continue to be used along the river and where volunteer trails cause water quality concerns these trails will be restored as occurred under existing management practices.
Policy 5: Off-road vehicle use is prohibited in the Lake Tahoe region except on specified roads, trails, or designated areas where the	Y	Y	Y	Y	Y	See noise Goal #1, Policy 4.

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
impacts can be mitigated.						
Dispersed Recreation Goal #2: Provide high-quality recreational opportunities.						
Policy 1: Wilderness and other undeveloped and unroaded areas shall be managed for low-density use.	Y	Y	Y	Y	Y	Implementing Alternative 1, 3, 4 or 5 would maintain or increase the area of Washoe Meadows SP available for low-density use. Under Alternative 2, areas available for low-density use would be traded between Washoe Meadows SP and Lake Valley SRA. Much of the area traded by relocating the golf course is previously disturbed higher capability land. Furthermore, other more sensitive areas previously occupied by the golf course would become available for low-density use.
Policy 2: Separate use areas shall be established for the dispersed winter activities of snowmobiling, cross-country skiing and snowshoeing when conflicts of use exist.	Y	Y	Y	Y	Y	Under Alternatives 1–4, snowmobiling would continue to be allowed on the driving range portion of the golf course and would continue to be separate from the areas used for snowshoeing and cross-country skiing. Under Alternative 5, the snowmobiling track would be eliminated with the golf course. Snowshoeing and cross-country skiing would continue to be allowed on an informal basis throughout the study area.
Developed Recreation Goal #2: Provide for the appropriate type, location, and rate of development of outdoor recreational uses.						
Policy 1: Expansion of recreational facilities and opportunities should be in response to demand.	Y	Y	Y	Y	Y	Existing recreation facilities would not be expanded, Alternative 2 would include reconfiguring the existing golf course; however, the golf course would remain as an 18-hole regulation course. PAOTS are currently not allocated to the Lake Tahoe Golf Course. PAOTS would likely be allocated to the Lake Tahoe Golf Course as part of the approval process under all alternatives.
Policy 2: Bicycle trails shall be expanded to provide alternatives for travel in conjunction with transportation systems.	Y	Y	Y	Y	Y	See Transportation Objective #4, Policy B.
Policy 7: Development of day-use facilities shall be encouraged in or near established urban areas, whenever practical.	Y	Y	Y	Y	Y	The study area is in proximity to several urban areas. Golf courses are considered a day-use facility. Golfing opportunities would continue to be available within the study area under Alternative 1, 2, 3, or 4. Golfing opportunities in the study area would be eliminated under Alternative 5; however, other day-use opportunities (e.g., hiking, biking, and cross country skiing) would continue within the study area. PAOTS would likely be allocated to the Lake Tahoe Golf Course as part of the approval process under all alternatives.
Developed Recreation Goal #3: Protect natural resources from overuse and rectify incompatibility between uses.						

Table 3.2-1
Consistency with Relevant Land Use Plans and Policies

Plans and Policies	Consistency					Discussion
TRPA Goals and Policies	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	
Policy 1: Recreation development in the Tahoe basin shall be consistent with the special resources of the area.	Y	Y	Y	Y	Y	Recreational uses under all of the alternatives would be consistent with the SRA and SP designations of the two park units and resources of the area. No new recreational uses are proposed under any of the alternatives.
Policy 2: Regulate intensity, timing, type, and location of use to protect resources and separate incompatible uses.	Y	Y	Y	Y	Y	See Dispersed Recreation Goal 2, Policies 1 and 2.
Developed Recreation Goal #4: Provide for the efficient use of outdoor recreation resources.						
Policy 2: Seasonal facilities should provide opportunities for alternative uses in the off-season, wherever appropriate.	Y	Y	Y	Y	Y	Recreation opportunities in the study area would be provided year-round under all of the alternatives. Spring/summer/fall recreation opportunities, such as hiking, biking, and fishing, would be available under all alternatives. In addition, winter recreation opportunities such as snowshoeing and cross country skiing would be available under all alternatives. Additional recreation opportunities such as golfing and snowmobiling (on a managed track within the driving range) would be available under Alternative 1, 2, 3, or 4.
Institutional Goal #1: Coordinate all planning and development review activities with the affected jurisdictions and agencies.						
Policy 1: All projects proposed in the region [other than those to be reviewed and approved under the special provisions of the Compact relating to gaming] shall obtain the review and approval of the Agency.	NA	Y	Y	Y	Y	All alternatives will be reviewed.
Policy 2: No project may be approved unless it is found to comply with the Regional Plan and with any ordinances, rules, and regulations enacted to effectuate the Regional Plan.	NA	Y	Y	Y	Y	Alternative 1 does not change the relationship of the study area to the Regional Plan. The action alternatives reflect implementation of Regional Plan provisions, ordinances, rules and regulations.

Note: NA = not applicable.

Sources: TRPA 1996; TRPA 2004; Consistency analysis conducted by EDAW (now AECOM) in 2009

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3.3 HYDROLOGY AND FLOODING

This section summarizes existing hydrologic conditions in the study area, presents the regulatory guidance for hydrologic resources, and evaluates potential adverse environmental effects related to hydrology associated with project implementation.

The examination of hydrology is based on information from (1) the review of academic research and available information published by Federal, State, and local agencies, primarily the *Upper Truckee River Upper Reach Environmental Assessment Report* (Swanson Hydrology + Geomorphology [SH&G] 2004a), the *Upper Truckee River Upper Reach Reclamation Project Amendment Report* (SH&G 2004b), and the *Riparian Ecosystem Restoration Feasibility Report* associated with the Upper Truckee River Restoration Project (River Run Consulting 2006); and (2) the preliminary engineering schematic conceptual design prepared for the alternatives.

For a discussion of geomorphology and water quality issues, please refer to Section 3.4, “Geomorphology and Water Quality.” Cumulative hydrology and flooding impacts are addressed in Section 3.16, “Cumulative Impacts.” Consistency with TRPA goals and policies is presented in Section 3.2, “Land Use,” Table 3.2-1. The project’s effects on thresholds are described in Section 4.6, “Consequences for Environmental Threshold Carrying Capacities.”

3.3.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

Clean Water Act

The principal Federal regulations affecting the project’s hydrology issues are those in the Clean Water Act (CWA) that regulate discharges into waters of the United States, including a range of potential point and nonpoint sources of water-transported pollutants, and the discharge of fill into waters such as wetlands and intermittent stream channels. The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation’s waters through prevention and elimination of pollution.

The law requires that a CWA Section 404 permit be obtained from the U.S. Army Corps of Engineers (USACE) for any dredged or fill materials discharged into wetlands or waters of the United States. A National Pollutant Discharge Elimination System permit is required through the appropriate regional water quality control board (RWQCB) (CWA Section 401) and is described in more detail in Section 3.4, “Geomorphology and Water Quality.” A water quality certificate is also required from the appropriate RWQCB (CWA Section 401), as described below, and all projects must be consistent with the State Non-point Source Pollution Management Program (CWA Section 319). Projects effecting waterbodies identified as impaired would also need to comply with Section 303(d) of the CWA. Waterbodies subject to Section 303(d) of the CWA are discussed further in Section 3.4, “Geomorphology and Water Quality.”

Floodplain Regulations

Executive Order 11988 for Floodplain Management directs all Federal agencies to evaluate potential effects of any actions they may take in the floodplain and to avoid all adverse impacts associated with modifications to floodplains. It also directs Federal agencies to avoid floodplain development whenever there is a practicable alternative and to restore and preserve the natural and beneficial values served by the floodplains (U.S. Environmental Protection Agency [EPA] 2008).

The lands within the floodplain adjacent to the Upper Truckee River and Angora Creek are regulated as part of the National Flood Insurance Program (NFIP). Areas of special flood hazard are identified by the Federal Emergency Management Agency (FEMA), which issues regulatory floodplain maps (Flood Insurance Rate Maps [FIRMs]). The NFIP mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in a material (more than 1 foot) increase in flood elevation. In addition, no development is allowed in delineated floodways within regulatory floodplains.

Any proposed project located within the regulatory floodplain must meet FEMA management and El Dorado County (County) floodplain management requirements and have a revised FIRM developed and submitted for approval.

If a floodplain is altered, a FIRM revision would be initiated by the issuance of a conditional letter of map revision (CLOMR) for the project. A CLOMR is FEMA's opinion that a project, upon construction, would affect the hydrologic or hydraulic characteristics of a flooding source and, thus, result in the modification of the existing regulatory floodway, the effective base flood elevations, or special flood hazard areas. The CLOMR does not revise an effective FIRM. Rather, it indicates whether the floodplain modifications, if built as proposed, would be recognized by FEMA as requiring a revision of the applicable FIRMs. If not, no further action is required. If the FIRM needs to be revised, a request would be made to FEMA to do so, after the proposed floodplain modifications have been completed. The FIRM would be revised to reflect modifications in special flood hazard areas. If the modifications meet FEMA's requirements, FEMA would issue a final letter of map revision.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act requires the State of California to establish water quality objectives and standards to protect water quality for beneficial uses. The State Water Resources Control Board (SWRCB) comprises nine RWQCBs that are responsible for preserving California's water quality. The RWQCBs issue waste discharge permits, take enforcement action against violators, and monitor water quality. SWRCB and the RWQCBs jointly administer most of the CWA regulations in coordination with the U.S. Environmental Protection Agency and USACE.

The study area is under the jurisdiction of the Lahontan RWQCB for the protection of surface water and groundwater quality from degradation by point and nonpoint sources of pollution. Designated beneficial uses and water quality objectives for the surface water and groundwater bodies in the study area are identified in the *Water Quality Control Plan for the Lahontan Region*, as amended (Basin Plan) (Lahontan RWQCB 1995:2-1–2-54) (see Section 3.4, "Geomorphology and Water Quality," for further discussion).

The Basin Plan identifies discharge prohibitions to protect 100-year floodplains. These prohibitions are separate from the prohibitions for protection of Stream Environment Zones (SEZs) identified by the TRPA. Not all 100-year floodplains are automatically considered SEZs. When a 100-year floodplain is considered a SEZ, the SEZ exemption criteria apply. In cases where the floodplain is not also an SEZ, the Lahontan RWQCB may grant exceptions to the 100-year floodplain discharge prohibitions for Lake Tahoe and its tributaries. Exemptions for this project could be granted under the following two circumstances (Lahontan RWQCB 1995:4.1-5–4.1-6):

1. Exemptions granted for projects which require access across floodplains to otherwise buildable sites if: (a) there is no reasonable alternative which avoids or reduces the extent of encroachment in the floodplain, and (b) the impacts on the floodplain are minimized.

2. Exemptions granted for erosion control projects, habitat restoration projects, SEZ restoration projects, and similar projects provided that the project is necessary for environmental protection and there is no reasonable alternative which avoids or reduces the extent of encroachment in the floodplain.

The Basin Plan also states that all public utilities, transportation facilities, and other necessary public uses located in the 100-year floodplain must be constructed and maintained to prevent damage from flooding and to avoid causing flooding.

TRPA Thresholds and Other Requirements

1987 Regional Plan

TRPA, a bi-state agency of California and Nevada, was created in 1969 and charged with attaining and maintaining environmental thresholds to prevent further degradation and improve the quality of Lake Tahoe and the surrounding basin. The TRPA *Regional Plan* is a compilation of documents and policies adopted in 1987, including the TRPA Goals and Policies, Code of Ordinances, Water Quality Management Plan, Plan Area Statements, and Scenic Quality Improvement Plan.

There is currently a collaborative effort among TRPA, the U.S. Forest Service, the Lahontan RWQCB, and the Nevada Division of Environmental Protection, called Pathway, to update the 1987 *Regional Plan* and each agency's respective management plan in 2011. The plan will be used to guide environmental regulations and resource management in the Tahoe Basin for the next 20 years.

Regional Plan Goals and Policies

The TRPA Goals and Policies document presents the overall approach to meeting the environmental thresholds. The TRPA Code of Ordinances regulates project construction activities under Chapter 25, particularly in relation to temporary (Code 25.2.A), and permanent (Code 25.2.B) best management practices (BMPs). Temporary BMPs, in accordance with TRPA's *Handbook of Best Management Practices* and as required in Chapter 62 of TRPA's Code of Ordinances, shall be implemented on construction sites and maintained throughout the construction period. Permanent BMPs may be required within the parcel and/or entire project area, although BMP retrofit requirements for the project area (pursuant to Subsection 25.2.B (2) may fall under a TRPA exemption (Code 25.3), for the following categories of projects:

(c) SEZ restoration.

"SEZ" is defined by TRPA as the major and minor streams, intermittent streams, drainageways, meadows and marshes, primary and secondary riparian vegetation, and other areas of water influence zones within the Tahoe Basin that provide natural treatment and conveyance of surface runoff (TRPA 2004:28). Standard BMP requirements applicable to this project deal mainly with drainage conveyance. Drainage conveyances through a parcel shall be designed for at least a 10-year, 24-hour storm. Drainage conveyances through a SEZ shall be designed for a minimum 50-year storm.

Code of Ordinances

The TRPA Code of Ordinances also addresses floodplain management. According to Chapter 28, "Natural Hazard Standards," of the Code of Ordinances, TRPA shall review additional development in 100-year floodplains, as defined by the FIRM, and regulate public utilities, transportation facilities, and other necessary public uses located in the floodplains. TRPA has set a prohibition against any development, grading, and filling of lands within the 100-year floodplain, with certain exceptions that include specific public outdoor recreation facilities and water quality control facilities. Some projects qualify for an exemption as a water quality control project. TRPA may permit erosion control projects, habitat restoration projects, wetland rehabilitation projects, SEZ restoration projects and similar projects within a 100-year floodplain. To be permissible by TRPA, a restoration project within the floodplain must be necessary for environmental protection, be the only reasonable alternative to reduce the extent of encroachment, and fully mitigate all impacts (see page 28-3 of the Code of Ordinances).

TRPA's plan area statements (PASs) outline land use classifications, special policies, planning considerations, permissible uses, and maximum allowances for the Tahoe Basin. The study area is within PAS 119 (Country Club Meadow), which is classified as recreation land use. It is to be managed for outdoor recreation and natural resource values, including SEZ restoration opportunities. The Country Club Meadow PAS designates special policies and permissible uses regarding hydrology and flooding. The following policies are relevant to the proposed project: (a) natural areas should be buffered from intensive uses; (b) restoration of SEZ and land coverage removal should be encouraged, including strategies to mitigate golf course impacts; (c) a stream channel maintenance program should be implemented; and (d) development of impervious coverage should be discouraged. Appropriate permissible uses pursuant to Chapter 18 of the TRPA Code of Ordinances, "Permissible Uses," include runoff control and SEZ restoration among the allowed recreation, public service, and resource management uses (TRPA 2005).

Environmental Threshold Carrying Capacities

In August 1982, TRPA adopted Resolution No. 82-11, establishing environmental threshold carrying capacities (thresholds) for the region for nine resource topics (water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation). TRPA defines environmental thresholds as environmental standards necessary to maintain the significant resources in the region (TRPA 2002:1-1). These Tahoe Basin goals and standards indirectly define the capacity of the region to accommodate additional land development. TRPA established thresholds for water quality as a means to measure changes in the environmental health of Lake Tahoe and its contributing watershed. TRPA reevaluates threshold conditions and status every 5 years. The most recent evaluation of attainment status was conducted in 2006 (TRPA 2007:ES-3). Proposed changes to thresholds are being evaluated for adoption. Meanwhile, thresholds adopted in 1987 remain in effect and are used in this analysis.

The TRPA thresholds that deal with hydrology and flooding are those for soil conservation. TRPA has two soil conservation threshold standards:

- SC-1: Impervious Coverage Threshold Standard
  - Impervious cover shall comply with the Land Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning (Bailey 1974). (TRPA 2002:4-7). It has a "non attainment, but near attainment" status.
- SC-2: Naturally Functioning SEZ Threshold Standard
  - Preserve naturally functioning SEZs in their natural condition; restore 25 percent of SEZ lands identified as disturbed, developed, or subdivided to obtain a five percent total increase in the area of naturally functioning SEZ lands. (TRPA 2002:4-8). It has a "non attainment" status.

El Dorado County

The El Dorado County Grading, Erosion and Sediment Control Ordinance (Chapter 15.14) (El Dorado County 2007a) and the Tahoe Basin Special Conditions section of the *County Grading Design Manual* (Volume III [El Dorado County 2007b]) are applicable in the project vicinity, although State-owned land is not subject to local government ordinances.

Federal floodplain regulations are implemented by El Dorado County through County Ordinance Chapter 17.25, "Flood Damage Prevention," which controls the alteration of natural floodplains, stream channels, and natural protective barriers, including filling, dredging, and other development that may increase flood damage or divert floodwaters, thereby increasing flood hazards in other areas. The County appoints a community development director or authorized representative to oversee development permit applications within the floodplain and recently drafted a flood damage prevention ordinance, not yet adopted (El Dorado County 2008).

ENVIRONMENTAL SETTING

Hydrology

The study area is within the Upper Truckee River watershed, near the confluence of Angora Creek. Hydrologic characteristics of the area result from, and are distinguished by, several environmental parameters, including watershed-wide characteristics and climatic conditions, streamflow magnitudes and patterns, runoff from local natural and urbanized drainages, direct precipitation at the site, and groundwater elevations and gradients. Regional and watershed-scale factors of influence on hydrology also include geology, glacial history, geomorphology and soils, which are discussed in other relevant sections of this document.

Surface Water

Watersheds

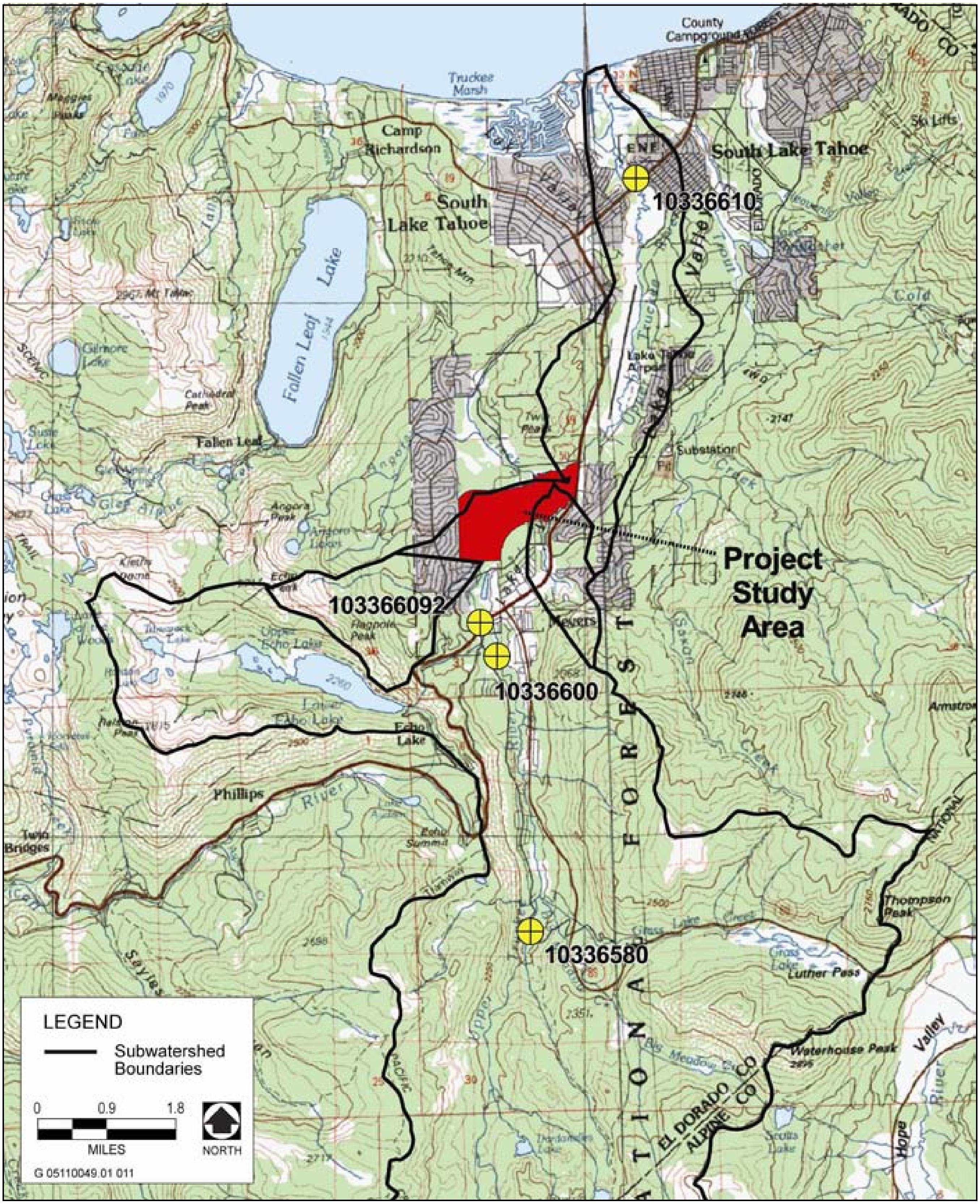
The Upper Truckee River is the largest tributary to Lake Tahoe, with a watershed that covers roughly 56 square miles. Exhibit 3.3-1 shows the watershed boundary and the U.S. Geological Survey (USGS) stream gauge locations on the river, discussed under the "Streamflow" section below. Angora Creek, which enters the Upper Truckee River in the study area, occupies approximately 6 square miles (SH&G 2004a:II-1–II-2). The Upper Truckee River headwaters are in undeveloped wilderness at elevations just over 10,000 feet along the El Dorado and Alpine County boundary. The 15-mile-long river flows northward through mountainous terrain, starting from the headwaters near Carson Pass and dropping down into a relatively narrow glacial valley with residential neighborhoods (Christmas Valley). Near the community of Meyers, Echo Creek enters from the west, and the river continues to flow through residential areas, adjacent to old quarries, and along the Lake Tahoe Golf Course, where it is joined by an unnamed creek from the southeast and Angora Creek from the west in the broad section of the Upper Truckee River watershed referred to as "Lake Valley." Downstream of the study area, the Upper Truckee River flows past the Lake Tahoe Airport and through former grazing lands, then passes through the commercial and residential corridor and north of U.S. 50. The Upper Truckee River then discharges to Lake Tahoe on the east side of the Tahoe Keys development in South Lake Tahoe. Lake Tahoe has a median lake elevation of 6,225.5 feet.

Surface Water Features of the Study Area

The surface water features in the study area include approximately 12,000 feet along the Upper Truckee River (for detailed Upper Truckee River reaches and stationing information, see Table 2-1); Angora Creek; an unnamed creek; some small seasonal drainages, as well as several golf course drainage swales and irrigation ponds; and, a stormwater treatment basin (Exhibit 3.3-2).

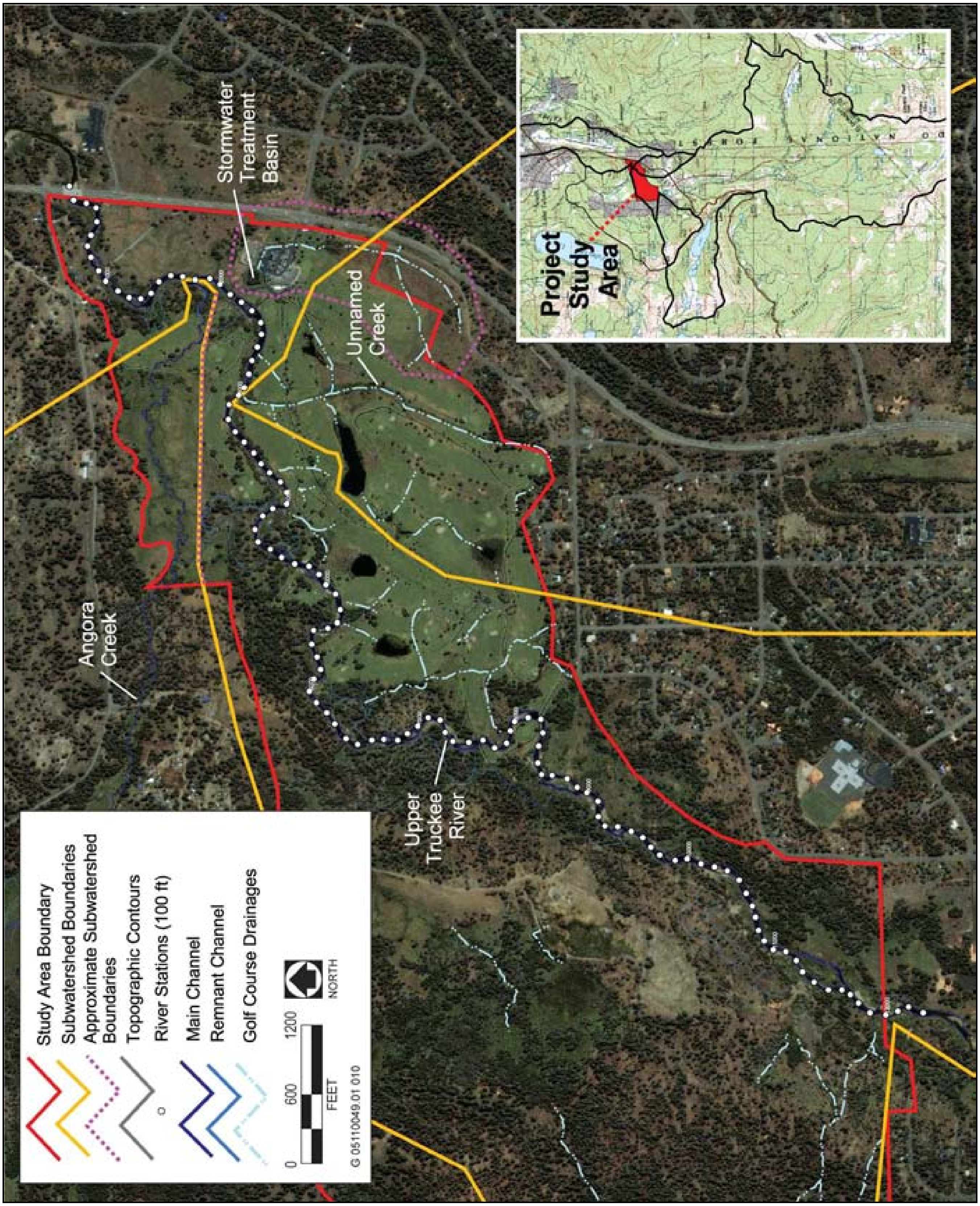
The study area section of the Upper Truckee River is located between the U.S. 50 crossing at Meyers and the U.S. 50 crossing at Elks Club Drive. Upstream of the study area, below the U.S. 50 crossing at Meyers, the Upper Truckee River noticeably changes from a confined, boulder-dominated channel to a wider, boulder-free alluvial river within a broader valley floor (SH&G 2004a:II-2). The Upper Truckee River flows through Washoe Meadows SP and Lake Valley SRA in the study area, with three distinctive reaches. The upper 1/3 is somewhat incised in glacial outwash with a narrower valley and forested floodplain. It goes through a transition reach to the lower ½ of the area which is characterized by a broader low gradient former meadow. The Lake Tahoe Golf Course surrounds much of the river in the study area. The river corridor is largely on public land, which includes USFS lands upstream and State lands in the study area (SH&G 2004a: II-2). There are some private parcels north of the river at the downstream end of the golf course between the river and Sawmill Road.

In most of the study area, the Upper Truckee River channel and present active floodplain (i.e., areas inundated by the 1.5- to 5-year peak streamflow events) is generally less than 200 feet wide and bounded by low, abandoned floodplain terraces and high, former glacial outwash terraces. The channel is entrenched within outwash terraces in the upper half of the study area and transitions to a broader floodplain meadow in the downstream half (River Run Consulting 2006:12). The channel is incised, with limited connection to the historic floodplain. Analysis of



Source: USGS 7.5-Minute Quadrangle Maps and USGS Surface Water Stations

Upper Truckee River Watershed and Stream Gauge Locations **Exhibit 3.3-1**



Source: VM Consulting 2009, with data from State Parks

Surface Hydrology and Watershed Boundaries of the Study Area **Exhibit 3.3-2**

historic photographs and topography suggests that the historic channel pattern in this area was more meandering than the current channel pattern (SH&G 2004a:III-41). There are remnants of high-amplitude, long-wavelength meanders on the floodplain, some visible in the forested areas along the river, others obscured by subsequent topographic modification for the golf course. A few of the old meander features have abrupt cutoffs that may have resulted from channel avulsion caused by debris jams or from incision caused by land use practices, including purposeful channel straightening by human intervention (River Run Consulting 2006:12). Additional information about the existing and historic stream condition and function is provided in Section 3.4, "Geomorphology and Water Quality."

Angora Creek drains a 5.9-square-mile subwatershed of the Upper Truckee River originating from Angora Lakes and flows through residential areas and large meadows before entering the river along its west bank at the downstream end of the golf course near river station (RS) 1800. The most downstream reach of Angora Creek is within the study area, dominated by a floodplain shared with the floodplain/terrace on the north side of the Upper Truckee River. More than 8,000 feet of the lower reaches of Angora Creek have been previously restored, including about 2,500 feet within the study area (SH&G 2004a:II-2).

The unnamed creek that enters the east bank of the Upper Truckee River near RS 3000 within the study area drains a small (0.81-square-mile) subwatershed (Exhibit 3.3-3). The unnamed tributary's headwaters are in the Tahoe Paradise Golf Course in Meyers. It flows along and under U.S. 50 and through the East San Bernardino residential neighborhood in the form of a channelized ditch (SH&G 2004a: II-2). The unnamed creek receives the bulk of its runoff from commercial and residential areas, including runoff directly from the golf course turf grasses and U.S. 50. The upstream section within Tahoe Paradise Golf Course has been channelized and has had much of its riparian vegetation removed (SH&G 2004a: III-56). The portion of the unnamed creek within the study area is a shallow, straightened channel through the golf course, with several small bridges for golf cart access.

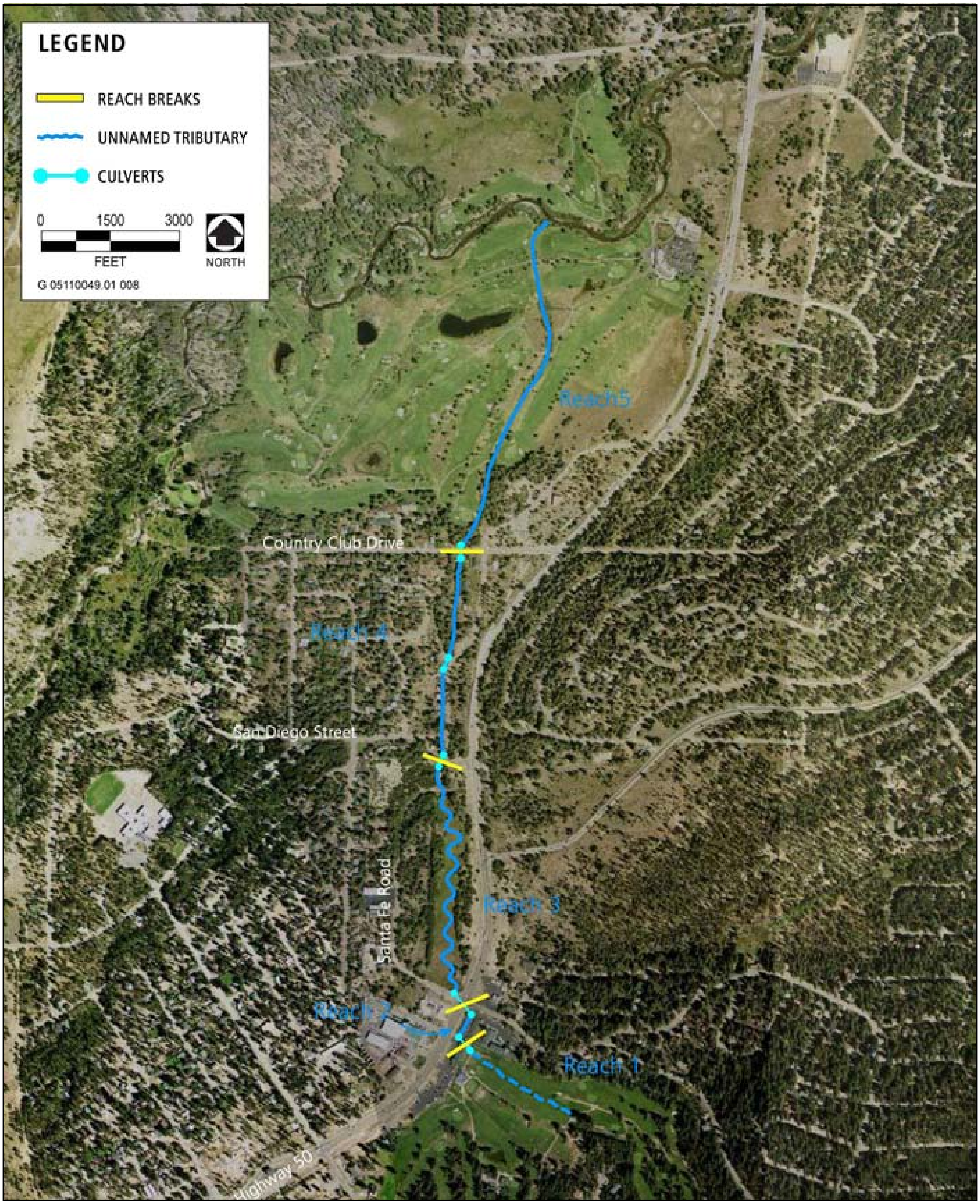
Other surface water features east of the Upper Truckee River within the study area are constructed ponds, including five golf course ponds and one stormwater treatment basin (Exhibit 3.3-2). The three larger golf course ponds were created during course construction when the sites were used as borrow sites for constructing the course topography (Stanowski, pers. comm., 2008). The largest pond (between the 9th and 18th fairways) is used to store irrigation water pumped from the river or groundwater wells. The smaller ponds were constructed and/or modified over the years to improve drainage within the course (Stanowski, pers. comm., 2008). The stormwater treatment basin located near the Lake Tahoe Golf Course maintenance yard was constructed in the 1980s in compliance with Lahontan RWQCB Orders No. 6-89-9 and No. 6-00-48, to capture and treat stormwater from the parking lot and some off-site roadside ditches.

West of the Upper Truckee River, additional surface water features include a few small ephemeral drainages (some that are spring fed) and the pond areas within the former quarry site, created by excavation that has intercepted groundwater.

Streamflow

The Tahoe Basin's climate is typified by cool, dry summers and cold, wet winters. Average annual precipitation ranges from 23 inches on the north end of the Upper Truckee River watershed (at Lake Tahoe) to 49 inches just south of Meyers (DWR 2004:1). The bulk of precipitation occurs as snow during winter and early spring, November through April (SH&G 2004a:III-1). There are periods of rainfall at either end of the winter season and during summer thunderstorms that may occasionally be intense (up to 1 inch of rain in a few hours). Infrequently, large, warm rainstorms during the winter months, dubbed "Pineapple Express" storms, bring large volumes of water and melt preexisting snowpack, producing extreme streamflows and flooding (SH&G 2004a:III-1).

The seasonal snowmelt process creates annual streamflow peaks in late spring to early summer (May or June). The snowpack at lower elevations can melt completely and generate runoff in the urban areas and valley floors near the lake, before the snow at the headwaters melts. The minimum streamflows occur during late summer and fall.



Source: SH&G 2004a, Figure 5.1

Reaches of the Unnamed Creek **Exhibit 3.3-3**

The dominant streamflow influence in the study area is the Upper Truckee River, which is recorded by USGS at four locations in the watershed (Exhibit 3.3-1). The gauges most relevant to the study area include USGS gauge #10336600, which operated from 1960 to 1986 just downstream of the U.S. 50 crossing at Meyers above Echo Creek, and the active USGS gauge #103366092, which is just below Echo Creek and has been operational since 1990 (Table 3.3-1).

Table 3.3-1
U.S. Geological Survey Streamflow Stations within the Upper Truckee River Watershed

Station Name	USGS Gauge	Period of Record (Water Years)	Contributing Drainage Area (Square Miles)	Percent of Basin Gauged
Upper Truckee River at U.S. 50 above Meyers	103366092	1990 to present	39.2	68.8
Upper Truckee River near Meyers	10336600	1961–1986	33.2	58.6

Sources: Rowe and Allander 2000, USGS 2008

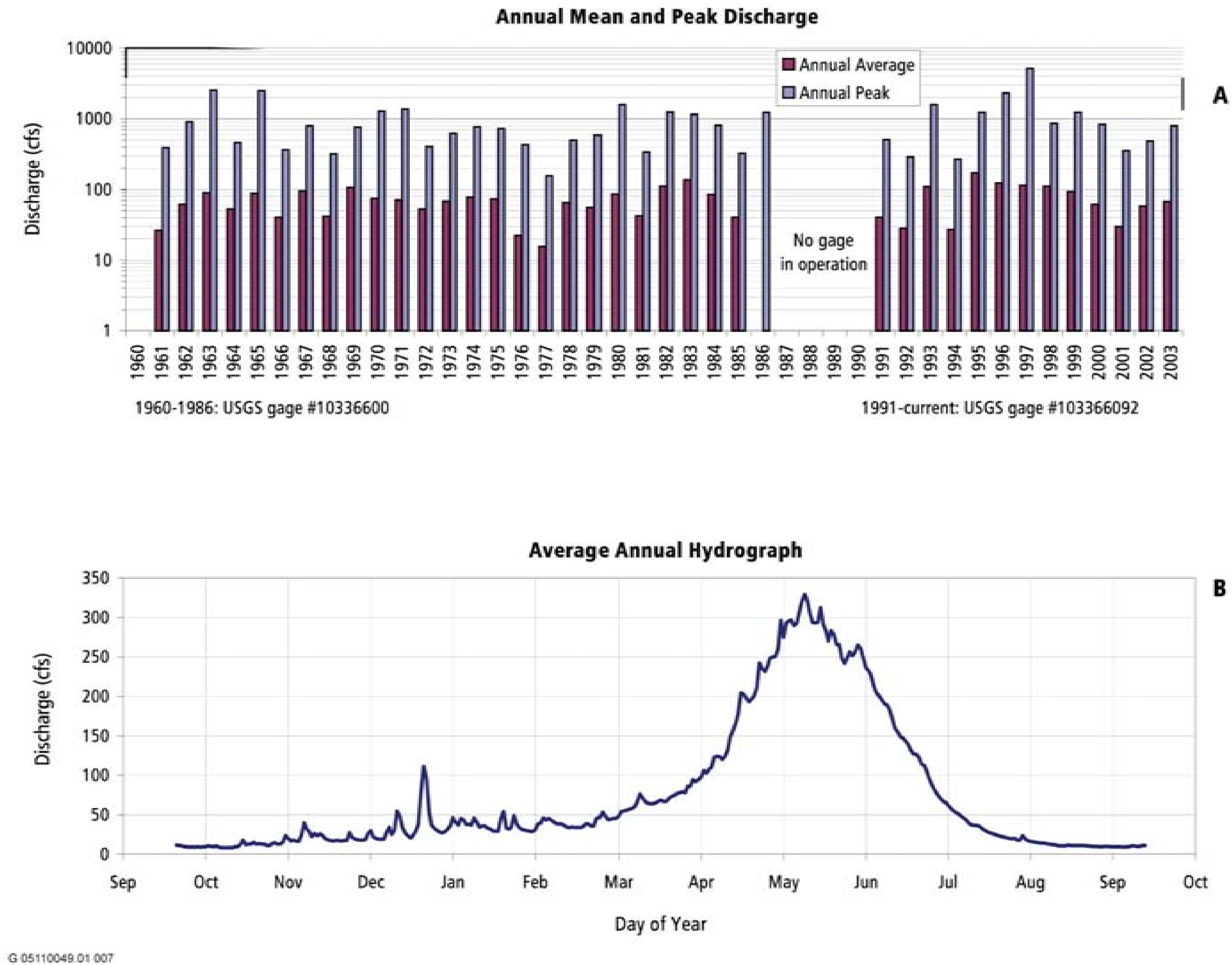
The average annual streamflow (i.e., discharge) for the Upper Truckee River at the gauges near Meyers (#103366092 and #10336600) is 72 cubic feet per second (cfs) over the 38 years of record (SH&G 2004a:III-2). Average annual streamflow varied from approximately 10 to 20 cfs in dry years (e.g., 1976, 1977, 1992) to more than 100 cfs in wet years (e.g., 1982, 1983, 1995, 1996) (Exhibit 3.3-4). The seasonal pattern of Upper Truckee River streamflow (i.e., hydrograph) for the same 38 years of record features a snowmelt runoff peak in the late spring through early summer (May through June) (Exhibit 3.3-4). The average daily streamflow during the snowmelt season generally remains more than 100 cfs and rises to more than 300 cfs. The seasonal maximum in average daily flows during snowmelt varies from year to year, ranging between 300 and 1,000 cfs (River Run Consulting 2006:9). Summer and early fall base flows (July through November) are minimal as a result of low precipitation and high evapotranspiration during that period. Both the Upper Truckee River and Angora Creek display large annual and seasonal variation in flow rates typical of unregulated alpine rivers receiving the bulk of their runoff from snowmelt.

Mean daily streamflow on the Upper Truckee River has also been described using statistics for the period of record (SH&G 2004a:III-2). Flow duration curves indicate the percentage of time that a particular flow is equaled or exceeded (Exhibit 3.3-5). The minimum flows would be those exceeded nearly 100 percent of the time (i.e., approximately 1.5 cfs), extreme high flows are those exceeded only roughly 1 percent of the time (i.e., approximately 500 cfs), and the median flow is the flow exceeded approximately 50 percent of the time (i.e., approximately 20 cfs). There are some minor differences in the curves when the data are sorted seasonally because the spring series has higher flows below the median and the fall/winter series has higher extremes (Exhibit 3.3-5). The flow duration curves for spring (March through July) and winter (August through February) periods show that the spring series has higher flows for the bulk of discharges (50 percent to 99.9 percent of time flow exceeded), but the winter series has higher peaks during the less frequent events (1 percent to 10 percent of time flow exceeded) (SH&G 2004a: III-2).

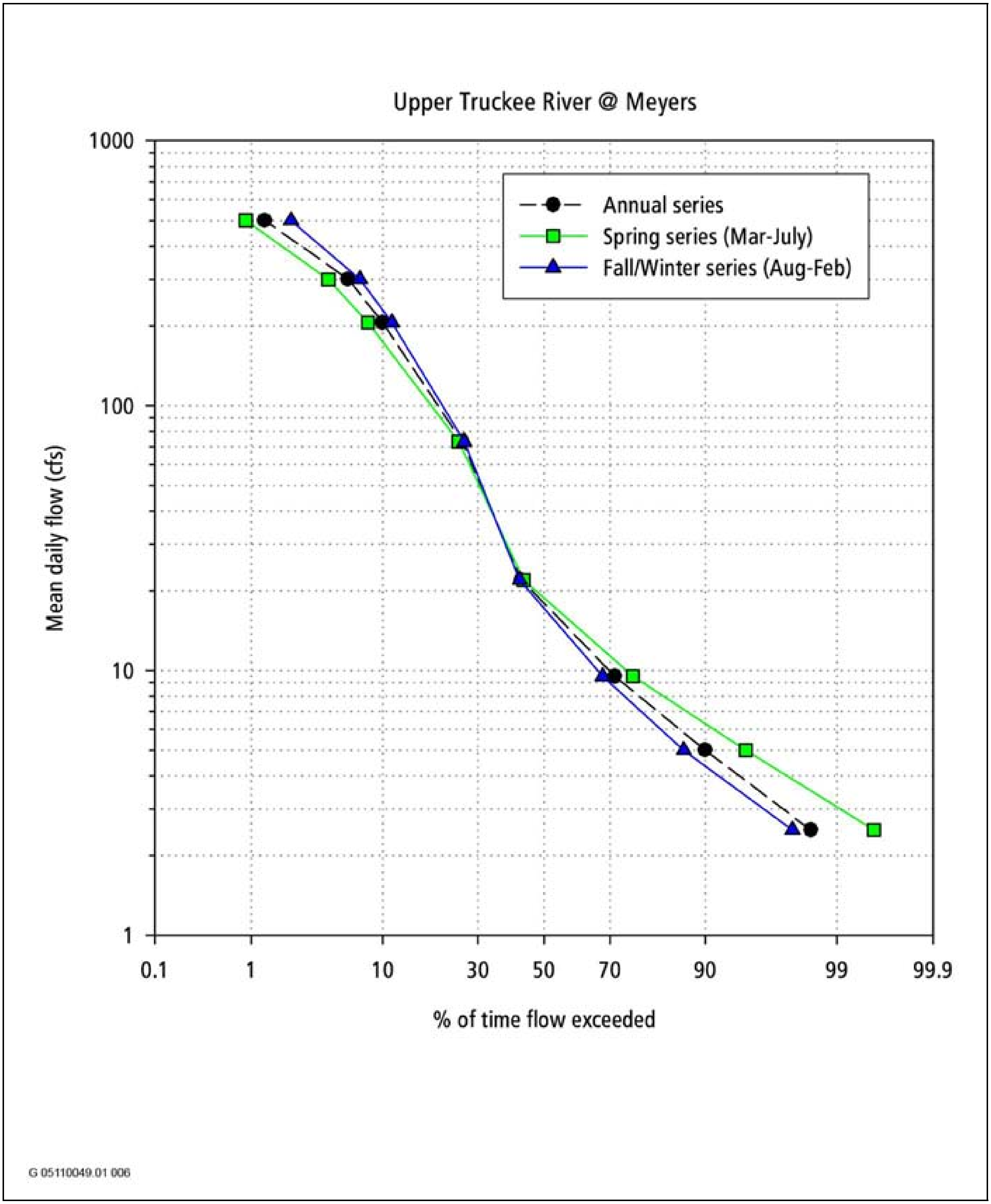
Climate-driven cycles can produce extreme highs and lows during a single year and from one year to the next. Precipitation timing, amounts, and mix of snow and rain can vary significantly from year to year (Coats and Goldman 2001:406, Rowe et al. 2002:13), producing year-to-year variability in streamflow. Future climate change may alter the spatial distribution and total amount of precipitation, the relative proportion of snow versus rain, and flood and drought extremes. The following information summarizes the anticipated effects of climate change on potential hydrology of the study area, based on available projections for the region. This discussion is not an estimate of the possible effects of the project on climate change, which is described in Section 3.16, “Cumulative Impacts.”

Upper Truckee River Annual and Peak Streamflow

Exhibit 3.3-4



Source: SH&G 2004a, Figure 3.2



Source: SH&G 2004a, Figure 3.4

Upper Truckee River Mean Daily Streamflow Duration Curves **Exhibit 3.3-5**

Over the last decade or so, a few studies have looked at potential climate change effects on surface and groundwater hydrology, water resource issues, or forest response for the Sierra Nevada or Lake Tahoe region, or both (Jeton, Dettinger, and Smith 1996; Knowles and Cayan 2004; Millar et al. 2004). These provide information about possible changes in water inputs to the project's study area (e.g., snowpack, rainfall, streamflow). Some studies have focused on the response of Lake Tahoe to climate change (e.g., Jassby, Reuter, and Goldman 2003; Coats et al. 2006), but have not commented directly on expected changes in tributary rivers.

The most useful data are those recently compiled and generated by Tetra Tech (2007). Tetra Tech (2007) explored the effects of climate change on overall watershed hydrologic response in relation to the total maximum daily load (TMDL) watershed model of pollutant loadings to Lake Tahoe. Tetra Tech (2007) used regional (within California) climate change projections by Dettinger (2005) and Cayan et al. (2006). Those studies used somewhat different modeling, downscaling, and meta-analysis approaches, but for the Tahoe Basin, they had close agreement on modeled, representative changes. Further, Dettinger (2005) provided predictions for the near future (c. 2050).

The central estimate for temperature and precipitation changes from the Cayan et al. (2006) paper and the Dettinger (2005) paper formed the basis of Tetra Tech's Central Projection model scenario: a 2°C warming and a 10 percent decrease in total precipitation by mid-century. Additional modeling scenarios were formulated by Tetra Tech (2007) using temperature increases of one standard deviation on either side of that central estimate (1°C and 3°C increases above current temperatures) and precipitation changes of one standard deviation above and below the central estimate (-25 percent and +15 percent of today's total precipitation, as well as a no change from today's precipitation).

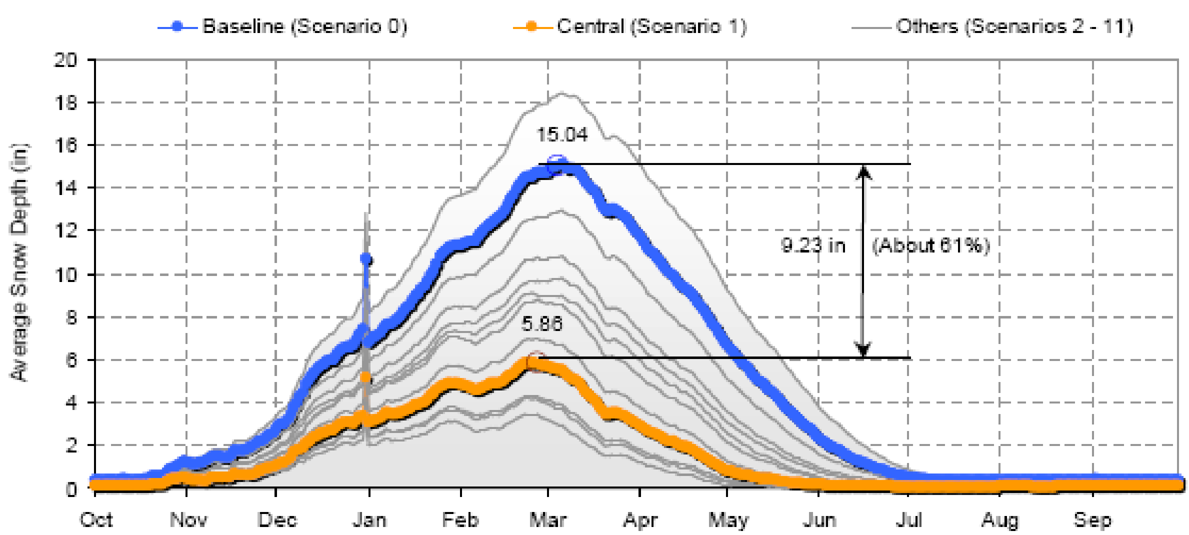
Tetra Tech simulated baseline (existing) and the various climate change scenarios for a 15-year model evaluation period (1990 through 2004) by applying the percent changes in temperature and precipitation uniformly to the historic weather data sets. Simulations with the spatially discrete (with 184 subwatersheds and 20 land uses) and temporally detailed (i.e., hourly time steps for the 15-year period) Tetra Tech model provide information on the range of conditions that could occur throughout Lake Tahoe watersheds in terms of total precipitation, air temperature and snow pack, and water yield from snow, as well as total outflow to streams (surface runoff and baseflow). An analysis of annualized daily snowpack from the model results is also provided by Tetra Tech (2007), which indicates the range of likely changes in snowpack depth, snow accumulation/snowmelt season, and timing shifts (Exhibit 3.3-6).

Local Runoff

Local runoff entering the study area or being generated within the study area has not been measured; however, it can be estimated for the purpose of sizing storm drainage facilities, as needed. In general, the runoff entering the study area via the unnamed creek would be expected to have slightly larger peaks and volumes under present developed watershed conditions than under the historic undeveloped status. Similarly, runoff generated within the golf course portion of the study area is likely to differ somewhat from prior natural conditions, because of alterations made to topography, soils, vegetation, and impervious surfaces and direct changes related to surface pond storage and irrigation. Runoff generated within the Washoe Meadows SP portion of the study area is likely to be fairly similar to natural conditions, except that roads and trails have compacted soil, and old quarry cut slopes have intercepted groundwater, both of which may increase surface runoff.

USACE, at the request of the Lake Tahoe Storm Water Quality Improvement Committee, is developing a new drainage design criteria manual to improve estimates of runoff volumes, peak discharges, and hydrograph shapes (USACE 2007). The methodology approved by the County and/or the committee at the time of project review would be applied to quantify runoff as a basis for the project's storm drainage feature modifications and/or mitigations. Tentative estimates of urban drainage hydrology in Section 3.3.2, "Environmental Consequences," are appropriate for the purpose of comparing alternatives (rather than for final design).

Scenario	Date			Relative to Baseline (Days)				Peak Percent Change
	Snowpack >0.5 in	Snowpack Peak	Snowpack <0.5 in	Pack Start	Peak Shift	Pack End	Duration	
Baseline	Oct 20	Mar 6	Jul 2	0	0	0	256	0%
Central (1)	Nov 10	Feb 27	May 11	+21	-8	-52	183	-61%
2	Oct 25	Mar 6	Jun 25	+5	0	-7	244	-14%
3	Oct 26	Mar 6	Jun 10	+6	0	-22	228	-35%
4	Oct 18	Mar 6	Jul 18	-2	0	+16	274	+22%
5	Oct 25	Mar 6	Jun 15	+5	0	-17	234	-29%
6	Oct 29	Feb 27	May 20	+9	-8	-43	204	-54%
7	Nov 17	Feb 24	Apr 27	+28	-11	-66	162	-72%
8	Nov 17	Feb 24	Apr 28	+28	-11	-65	163	-72%
9	Oct 26	Feb 27	Jun 1	+6	-8	-31	219	-42%
10	Nov 9	Feb 25	Jun 1	+20	-10	-31	205	-40%
11	Nov 25	Feb 24	Apr 22	+36	-11	-71	149	-77%



Snowpack Characteristics for Climate Change Scenarios **Exhibit 3.3-6**

Groundwater

Groundwater Basins

The study area is within the Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin, a water supply source for domestic and public water uses with elevations ranging from 6,225 feet at lake level to above 6,500 feet in the south (DWR 2004:1). There are a few domestic wells along Sawmill Road just north of the Upper Truckee River and Angora Creek confluence, and one public well south of the study area adjacent to U.S. 50 near Meyers (Rowe and Allander 2000:20). The California Department of Water Resources (DWR) has monitored several wells in the Tahoe Basin since the 1960s and, with the exception of some localized decreases in groundwater levels near the urban wells related to pumping, there has been no long-term change or decrease in water levels (DWR 2004:2).

Watershed Groundwater Conditions

Groundwater in the Upper Truckee River watershed generally parallels surface water flow and moves northward toward Lake Tahoe, discharging via seepage to stream channels and the lake (USACE 2003:1-2). Groundwater generally flows toward the stream channel (e.g., gaining reach) in the upper reaches of the watershed upstream of the study area. In the portion of the Upper Truckee River watershed within the study area, groundwater often parallels the stream channel (e.g., either a steady or losing reach) and local monitoring data discussed below shows both losing and gaining reach sections within the study area. Downstream of the study area, groundwater flows toward the Upper Truckee River channel (e.g., gaining reach); however, close to the lake, dominant groundwater flows toward the lake rather than toward the channel (Rowe and Allander 2000:31).

Hydraulic gradients (groundwater surface slopes) are greatest in the upper elevations of the Upper Truckee River watershed and decrease rapidly in the downstream valley areas. For example, the groundwater gradient near Luther Pass is 700–1,400 feet per mile (ft/mi) and decreases to 30–60 ft/mi in the lower Christmas Valley area. The hydraulic gradient ranges from approximately 20 to 40 ft/mi in the study area (Rowe and Allander 2000:31).

Local Groundwater Conditions

Groundwater conditions in the study area and vicinity can be described using a combination of long-term DWR monitoring wells in the vicinity and several more recent monitoring wells within the study area (Exhibit 3.3-7). A single DWR monitoring well with long-term groundwater levels is located south of the study area, between U.S. 50 and the East San Bernardino residential neighborhood (DWR 12N18E29L001M) (Exhibit 3.3-8). This monitoring well exhibited fairly steady groundwater levels over its period of record (1970–1994) (Exhibit 3.3-8), generally responsive to the surface water conditions of wet versus dry years. Groundwater at this well was typically between 12 and 22 feet below ground surface (bgs) (Exhibit 3.3-8).

Long-term ground level data within the study area come from three wells installed within the existing golf course (Exhibit 3.3-7) under a water quality monitoring and reporting program mandated by the Lahontan RWQCB (Lahontan Board Orders No. 6-89-9 and No. 6-00-4). Water levels in the Lahontan monitoring wells were sampled in 1994 and from 2000 through 2007 (Exhibit 3.3-9). Only the first couple of sampling events included all three wells; however, the data indicated that the two downstream locations (MW1 and MW3) had slightly deeper groundwater (approximately 4 feet bgs) than did MW2 (approximately 1–3 feet bgs). The upstream and downstream wells (MW2 and MW1, respectively) are both fairly close to the river; however, the downstream well (MW1) has water depths from 5 to 7 feet bgs, whereas the upstream well (MW2) has water levels ranging from 2 to 4 feet bgs (Exhibit 3.3-9). Compared with levels in other years, MW1 and MW2 show the highest groundwater levels in May 2005, with water at the surface of MW2. This likely reflects the peak in average annual surface runoff conditions.

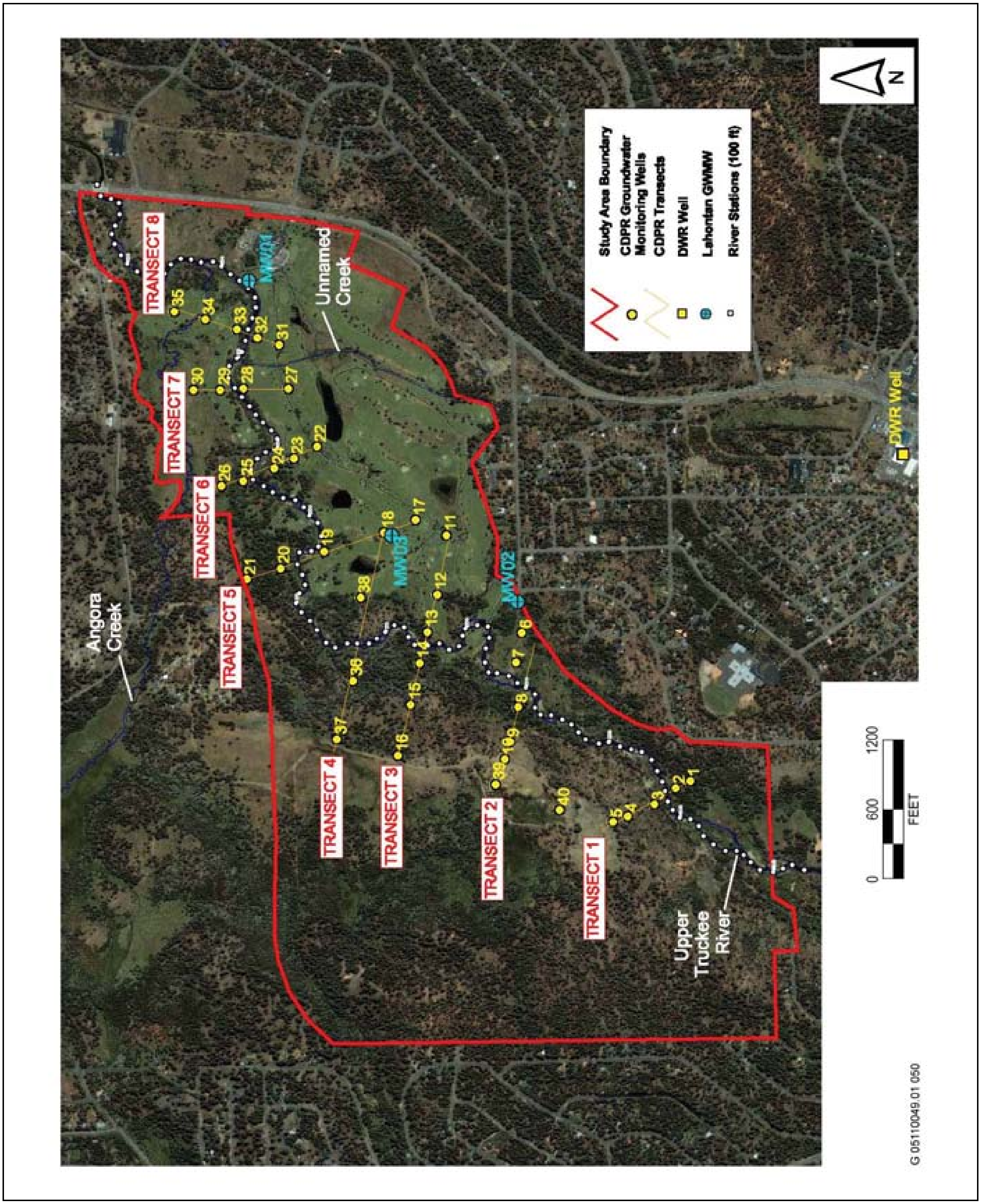
Between November 2006 and November 2007, State Parks installed 40 groundwater monitoring wells, arranged in several transects, across the study area (Exhibit 3.3-7). The first year of monitoring provides indicators of the range of seasonal groundwater conditions within the study area (Exhibits 3.3-10A to 3.10-G). The 2007 groundwater monitoring data indicate typical alluvial surface water–groundwater relationships. Groundwater generally follows the river down-valley (i.e., north and northeast), parallel to the river, as seen by comparing groundwater elevations at each transect in a down-valley order. Groundwater elevations along the east side of the river from Transects 2–8 show a down valley groundwater gradient in the range of 6–26 ft/mi, slightly less than that reported by Rowe and Allander (Rowe and Allander 2000:31). The down-valley gradient becomes gentler in the main meadow, with relatively consistent and small decreases in water levels between Transects 6, 7, and 8. The north side of Transects 5-8 is influenced by the previously restored Angora Creek, which has since experienced higher groundwater elevations.

At any given transect, groundwater generally flows toward the river, at least during the spring. Groundwater flows from the west side of the valley towards the river are relatively consistent in all seasons and throughout the study area, except for minor reverse flows away from the river in fall at Transect 2. High groundwater west of the river on the west edge of Transects 2, 3, and 4 are influenced by the quarry cutslope, small drainages, and surface seeps. A fall monitoring event that included surface water measurements shows the river at Transects 2, 3, and 4 to be steady or slightly gaining (groundwater flowing toward the river) on the left (west) bank and losing (groundwater flowing away from the river) along the right (east) bank, while farther downstream at Transects 5–8 the reach is shown to be gaining on the right bank. This could be attributed in part to the golf course ponds influence along Transects 5–7 and the decrease in valley gradient. Fall water levels decrease 2–3 feet, and spring levels as much as 4–6 feet east of the river as one moves toward the river (Exhibits 3.3-10D and 3.3-10E).

Large seasonal fluctuations of the groundwater level occur in some parts of the study area. For example, seasonal groundwater levels vary by approximately 6 feet near both sides of the Upper Truckee River at Transect 2 (Exhibit 3.3-10A), probably supported by the functional overbank flows within this reach. Seasonal groundwater levels vary by approximately 5 feet on the west side of the river along Transect 3 (Exhibit 3.3-10B), but on the east side of the incised channel at this same location groundwater is lower and remains lower all year. The wide fluctuation of seasonal changes in surface water and groundwater flows supplied from the west side slope is not transmitted across the incised channel. Large fluctuations are also evident across Transect 5 (Exhibit 3.3-10D) and the west side of Transect 6 (Exhibit 3.3-10E). In these transects, surface water within Angora Creek and along its functional floodplain west of the river supports higher spring and fall groundwater levels, while the area east of the incised river channel has lower groundwater that tends to remain lower in all seasons.

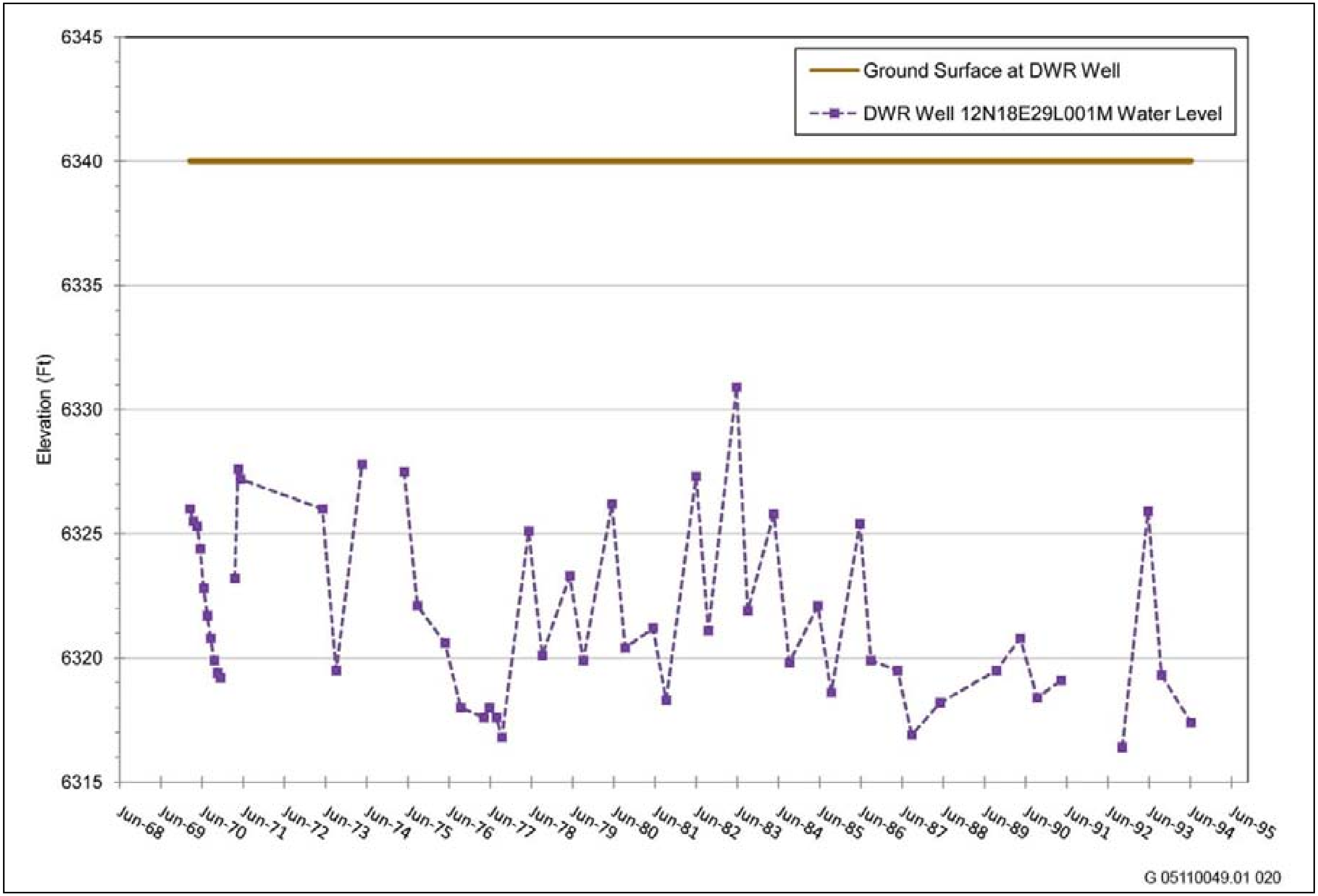
Seasonally consistent groundwater levels occur in a few locations, especially in transects 7 and 8, located farthest downstream (Exhibits 3.3-10F and 3.3-10G). Both sides of the Upper Truckee River have relatively small seasonal fluctuations in this area (approximately 1–2 feet), perhaps because of the influence of the Angora Creek system on the northwest and the golf course ponds and irrigation on the southeast. Consistently high groundwater levels are seen several hundred feet west of the river at the far west end of Transects 2, 3, and 4 (Exhibits 3.3-10A and 3.3-10B). Consistently low groundwater levels are noted east of the incised Upper Truckee River channel in Transects 3 and 4 (Exhibits 3.3-10B and 3.3-10C).

Groundwater levels and flow patterns in the study area and both upstream and downstream along the Upper Truckee River and portions of Trout Creek and other tributaries are degraded relative to natural conditions as a result of past direct actions and the stream's geomorphic response to those actions. Watershed-scale hydrologic changes, stream channel incision, and groundwater extraction for water supply have lowered groundwater levels along the incised channels and modified groundwater flow rates in areas of groundwater pumping, even reversed flows in areas with excessive extraction. The degraded conditions along incised channels interrupt groundwater flow paths and increases groundwater loss to surface water, reducing groundwater storage volume and groundwater storage from year to year. Groundwater conditions within particular reaches can influence groundwater and surface water within adjacent downstream reaches. The degraded groundwater status impairs near surface groundwater support for the high soil moisture conditions needed in meadows and marshes.



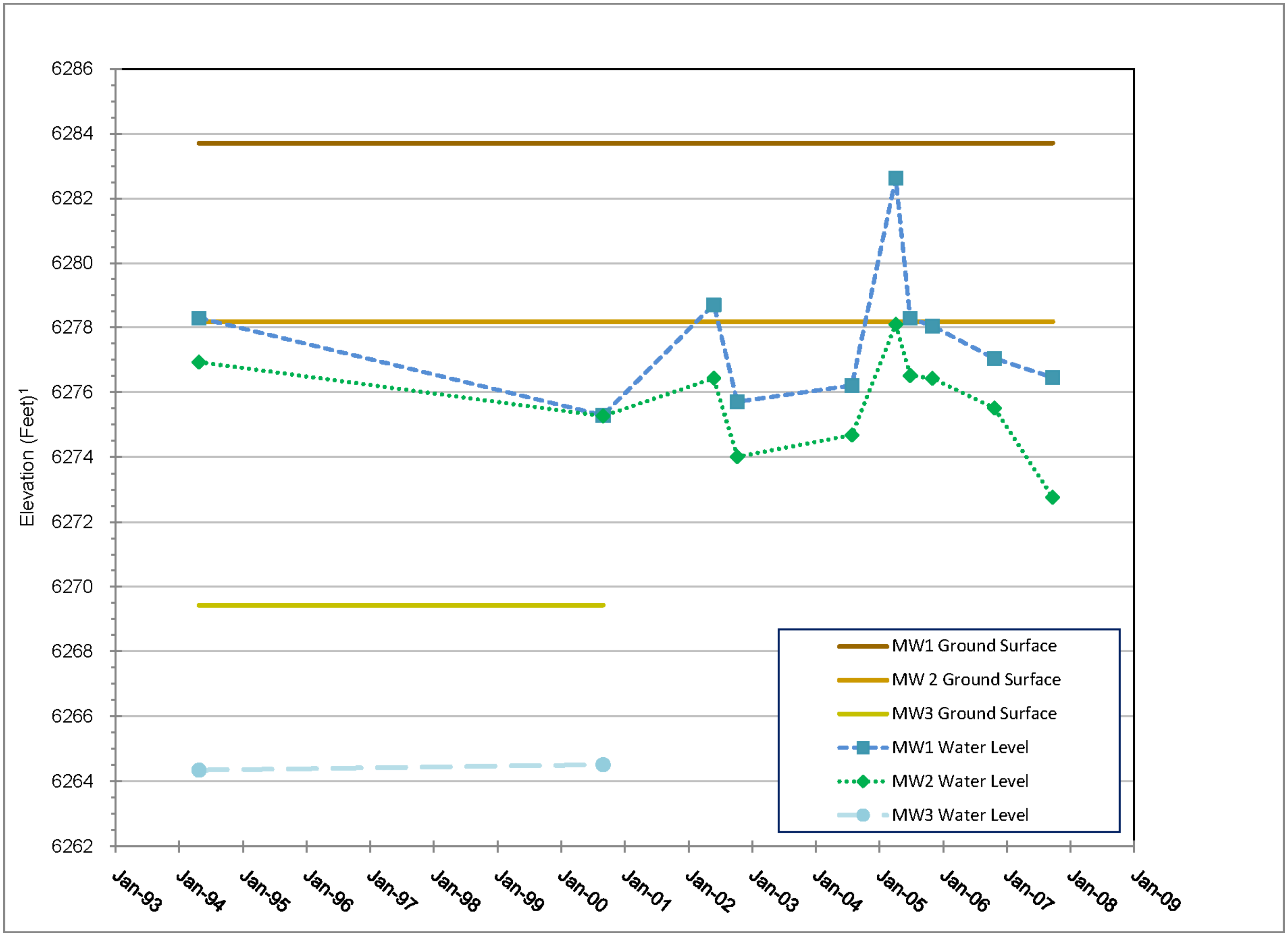
Source: VM Consulting 2009, with data from DWR and State Parks

Groundwater Monitoring Well Locations in the Study Area and Vicinity **Exhibit 3.3-7**



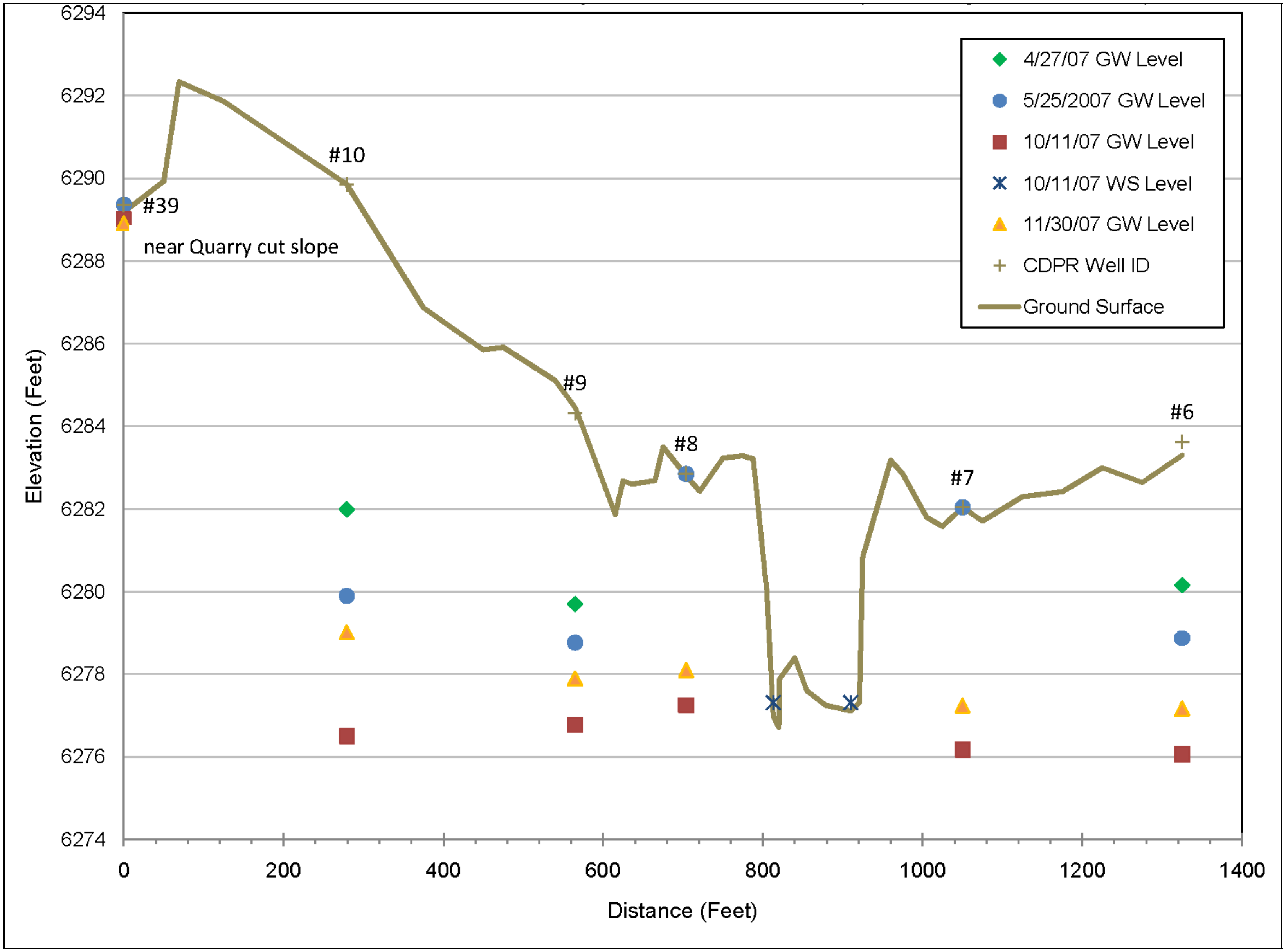
Source: DWR

Long-Term Groundwater Levels in the Vicinity **Exhibit 3.3-8**



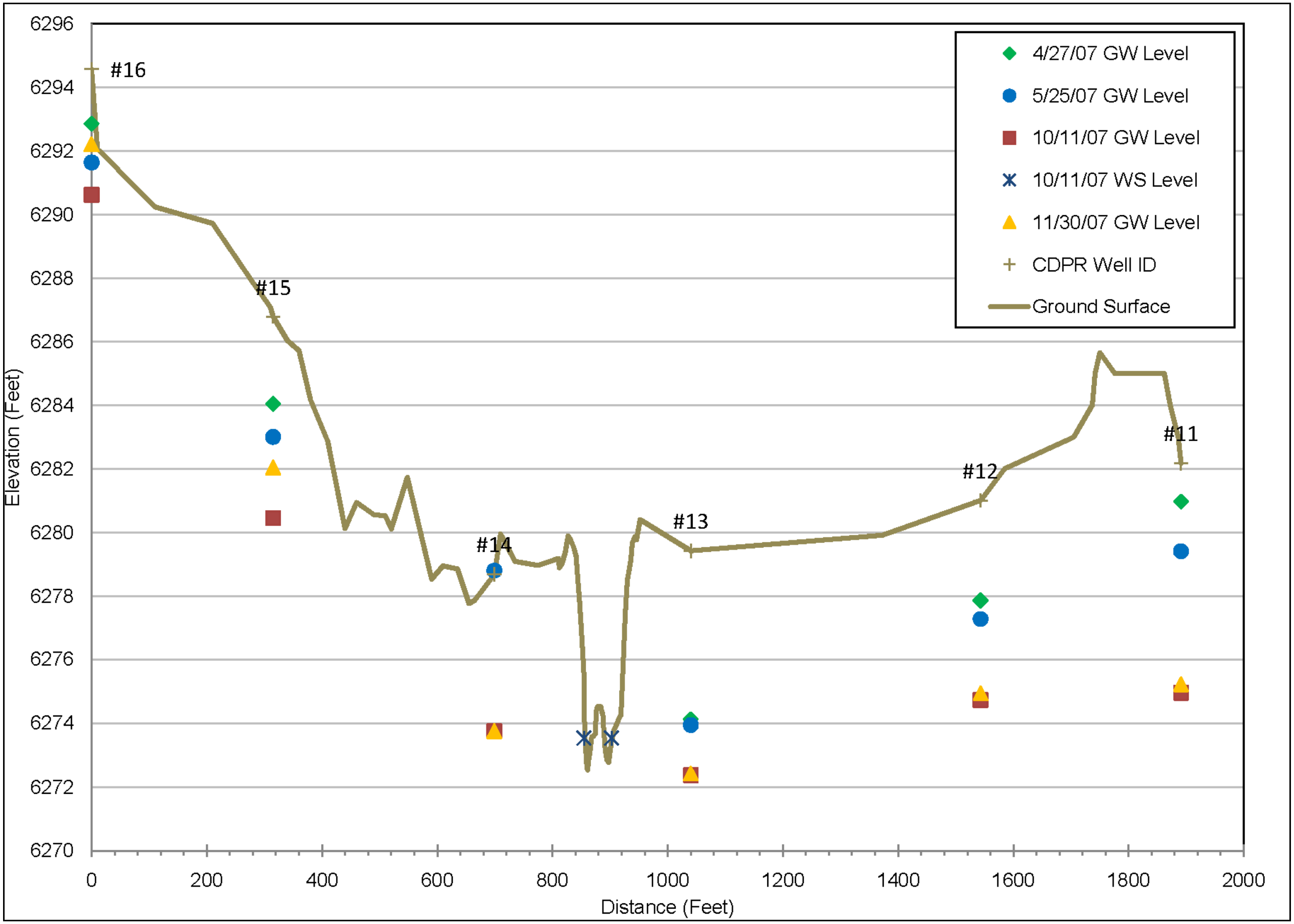
Source: VM Consulting 2009, with data from American Golf/Lahontan RWQCB

Long-Term Groundwater Levels in the Study Area **Exhibit 3.3-9**



Source: Data compiled by VM Consulting in 2009, with data from State Parks

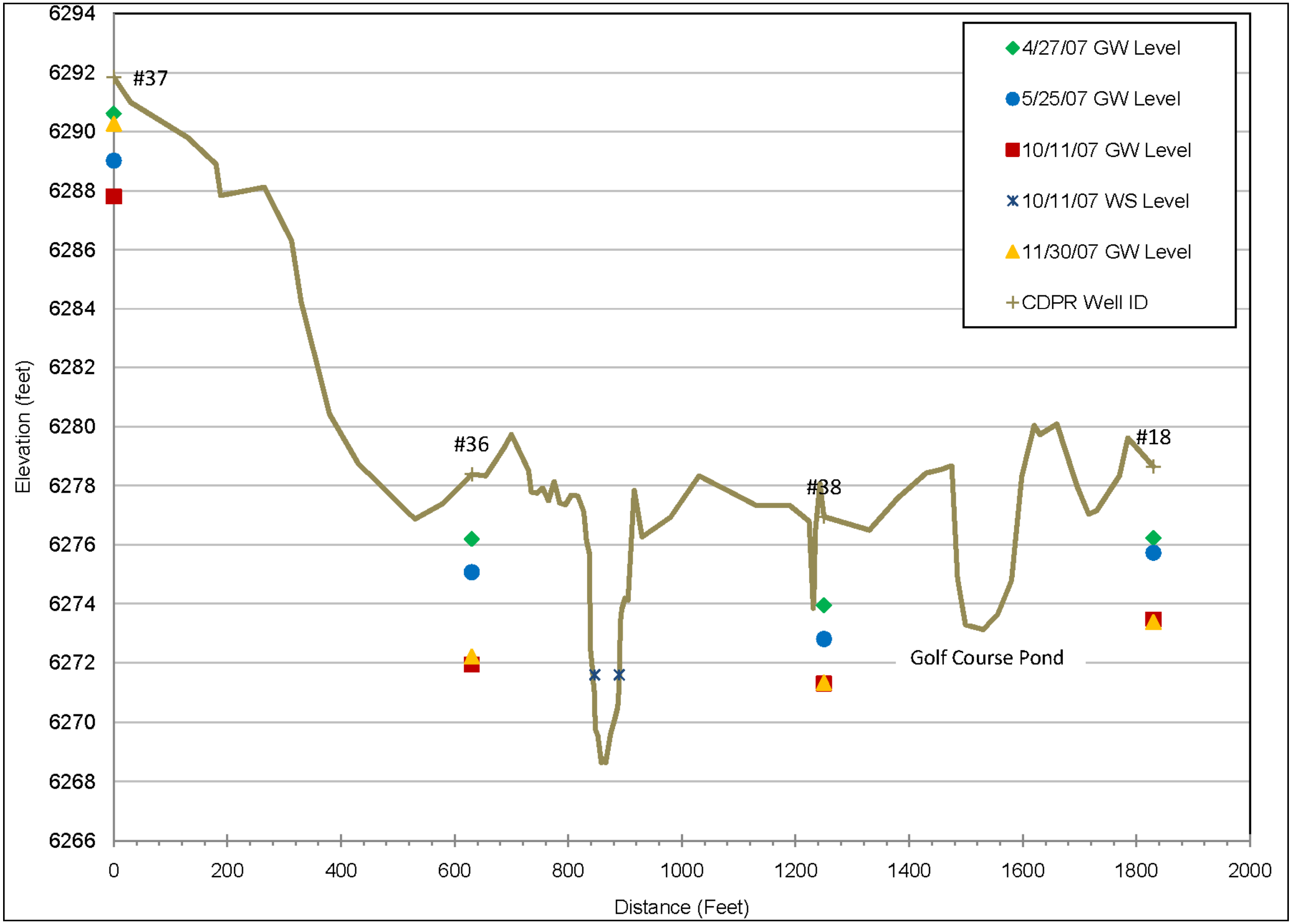
2007 Groundwater Levels within the Study Area, Transect 2 **Exhibit 3.3-10A**



Source: Data compiled by VM Consulting in 2009, with data from State Parks

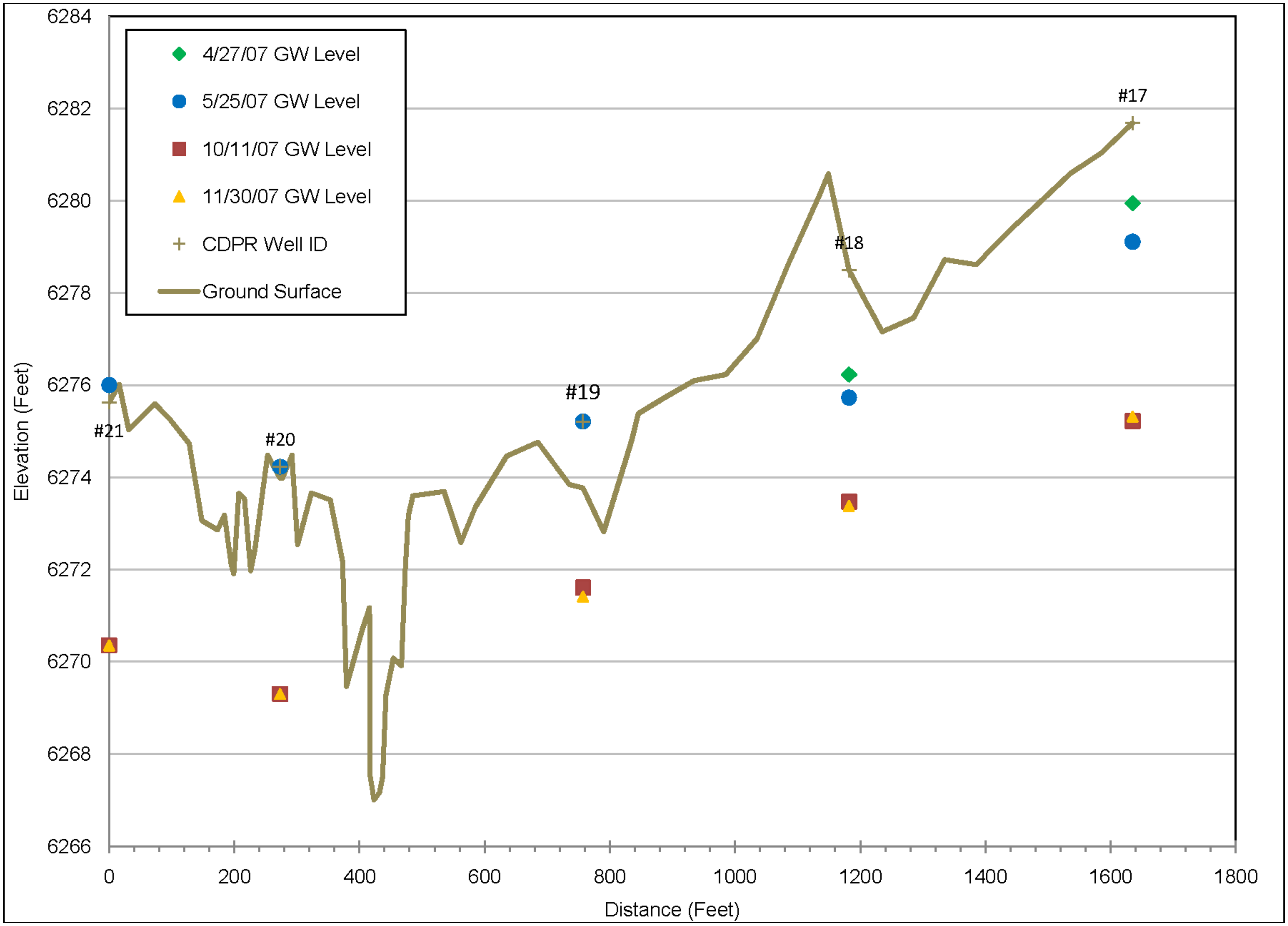
2007 Groundwater Levels within the Study Area, Transect 3

Exhibit 3.3-10B



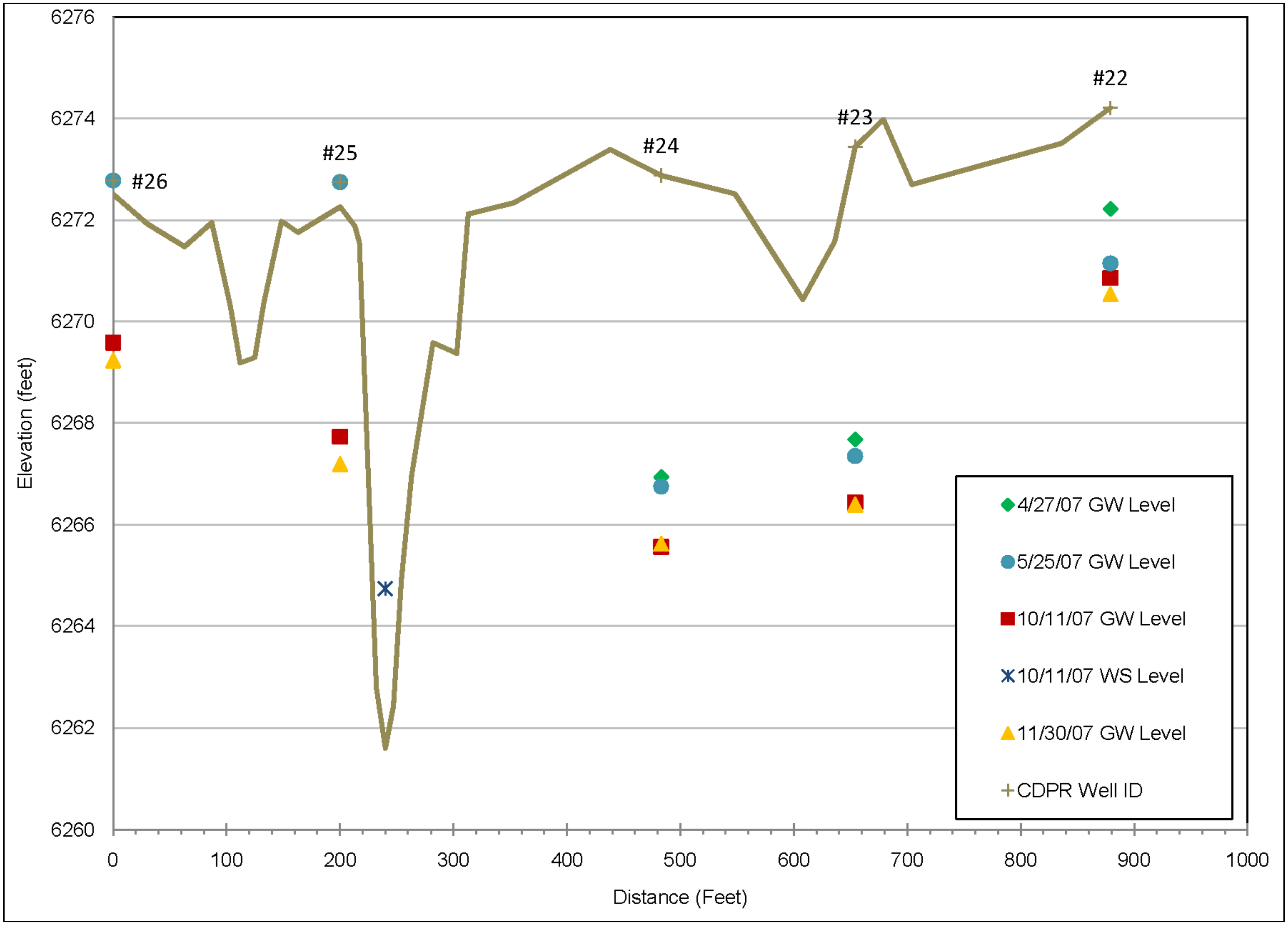
Source: Data compiled by VM Consulting in 2009, with data from State Parks

2007 Groundwater Levels within the Study Area, Transect 4 **Exhibit 3.3-10C**



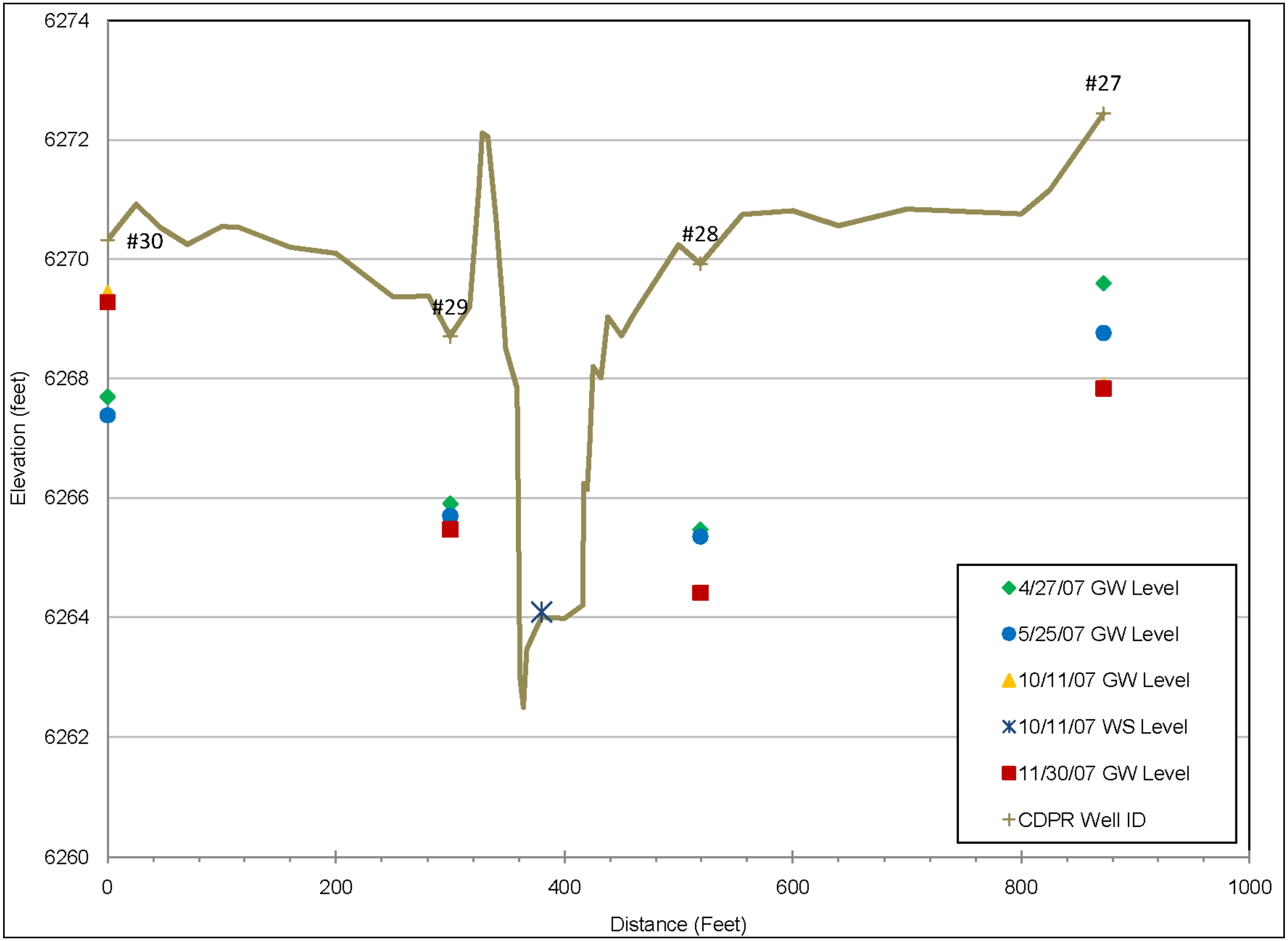
Source: Data compiled by VM Consulting in 2009, with data from State Parks

2007 Groundwater Levels within the Study Area, Transect 5 **Exhibit 3.3-10D**



Source: Data compiled by VM Consulting in 2009, with data from State Parks

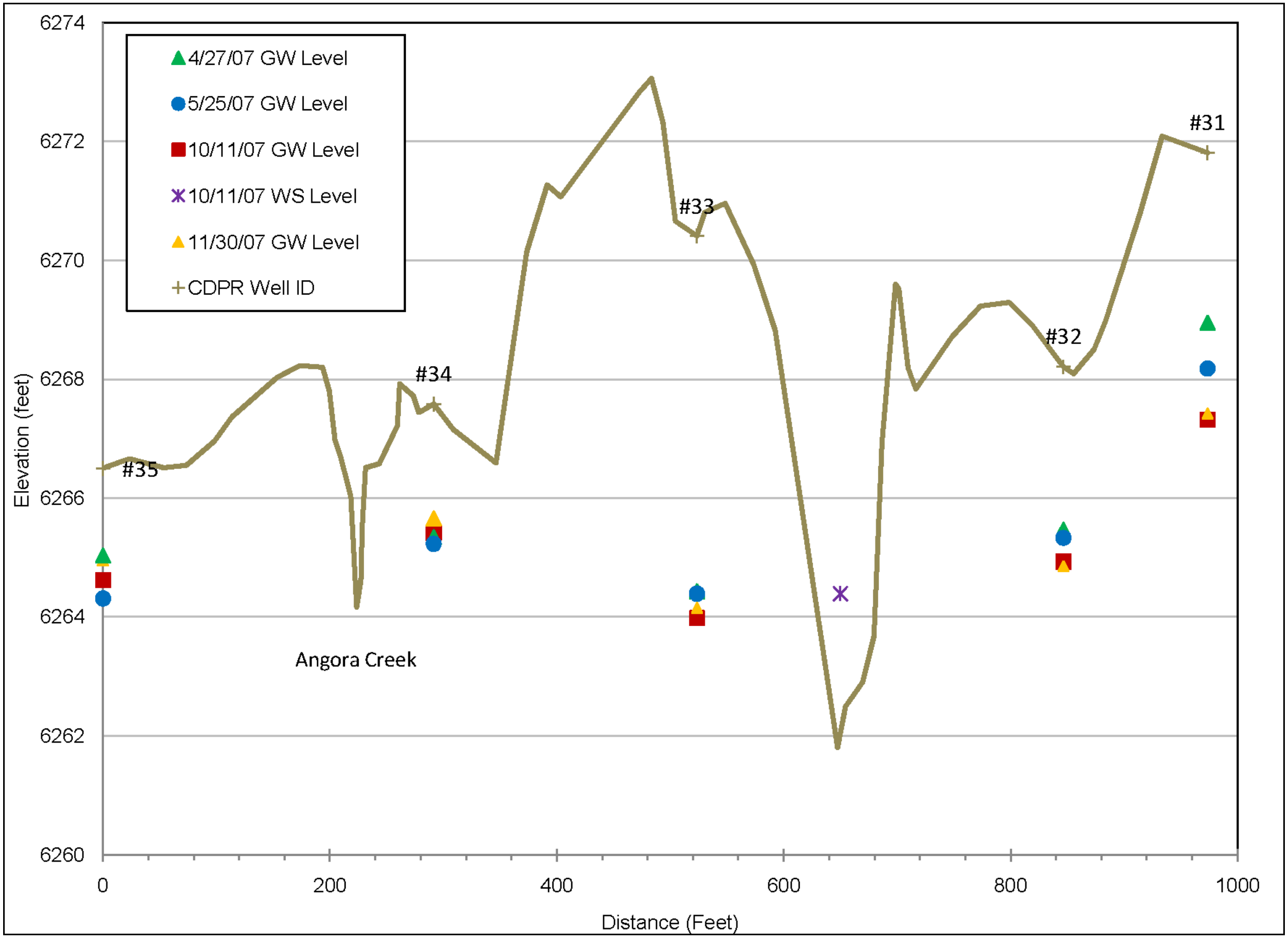
2007 Groundwater Levels within the Study Area, Transect 6 **Exhibit 3.3-10E**



Source: Data compiled by VM Consulting in 2009, with data from State Parks

2007 Groundwater Levels within the Study Area, Transect 7

Exhibit 3.3-10F



Source: Data compiled by VM Consulting in 2009, with data from State Parks

2007 Groundwater Levels within the Study Area, Transect 8 **Exhibit 3.3-10G**

Flood Frequencies

Streamflow in the Upper Truckee River is unregulated (i.e., there are no substantial dams or flow control structures upstream of the study area); therefore, streamflow magnitudes and frequencies are not managed. Rather, they occur as a function of climate and weather conditions, land use, vegetation cover, and channel and floodplain characteristics. Extreme peak flows associated with damaging floods on the Upper Truckee River are mostly, but not entirely, associated with winter season rain-on-snow conditions. These occur during large winter rainstorms where antecedent snowpack adds to the total runoff. For example, the flood of record on January 1, 1997, that resulted in a peak flow of 5,120 cfs at the Meyers USGS gauge was from rain-on-snow augmented runoff. The December 31, 1996, and January 1, 1997, storm produced rainfall below 8,000 feet mean sea level (msl), but occurred after prior snowstorms that left several feet of snowpack down to lake level (6,200 feet msl) (SH&G 2004b:11–12). Floods of moderate magnitude may result from spring snowmelt events, rainstorms, or rain-on-snow events. Flow from spring snowmelt tends to be less extreme because the snowpack melts gradually over the watershed’s various elevation zones. Summer thunderstorms in the Tahoe Basin are common and can be intense, but they are typically brief and cover only small portions of the watershed. They rarely produce substantial flooding or flood hazards in the vicinity of the study area (USACE 1999).

Statistical analysis of recorded streamflow is typically used to characterize various flood events. At least two sets of flood statistics were developed for the Upper Truckee River within the study area, using available data from the USGS gauges near Meyers (#103366092 and #10336600) and standard methods (Table 3.3-2) (SH&G 2004a:III-7, SWC 2007:10–11). The two studies produced estimates of the statistical frequency (expressed as return interval in years) for associated peak streamflow magnitudes (expressed in cfs). The values generated by statistical analysis represent the anticipated Upper Truckee River streamflow at the study area over the life of the project, if watershed hydrology remains similar to the last 40 years. High-magnitude, low-frequency flooding events (e.g., 25-year and 100-year recurrence interval events) have the potential to inundate large areas of the golf course, including areas near the clubhouse and a few residences along Sawmill Road, and are of concern for flood hazard analysis. Low magnitude, high frequency events (e.g., 1.5-year recurrence interval) are mostly of concern relative to optimizing channel design dimensions for geomorphic stability and overbanking processes. They are not critical for flood hazard analysis.

Table 3.3-2
Upper Truckee River Flood Frequency Analyses

	Instantaneous Peak Flow (cfs)			Average Daily Flow (cfs)		
Return Period	SH&G 2004	SWC 2007	Difference	SH&G 2004 >200 cfs	SWC 2007 >373 cfs	Difference
(years)	Annual Series			Partial-Duration Series		
1.5	502	537	7%	336	492	32%
10	1,950	1,937	-1%	1,120	1,034	-8%
50	3,780	3,713	-2%	2,250	1,611	-40%
100	4,830	4,720	-2%	2,960	1,916	-54%
n	39	41		129	67	

Notes: cfs = cubic feet per second; n = number of events
Sources: SH&G 2004b, SWC 2007

Instantaneous peak flows were analyzed using the Annual Series (the single maximum instantaneous value for any given water year), for slightly different periods of record (i.e., n of 41 versus 39). The estimated instantaneous peak flow magnitudes using the annual series are similar in both studies, as demonstrated by the small percent difference in results across the range of return periods.

Average daily flows calculated from streamflow collected at 15-minute intervals were analyzed using the Partial Duration Series approach, which includes all average daily flows during a given year above a particular threshold value. The results of this method are sensitive to the selected threshold value, which was 200 cfs for the SH&G analysis and 373 cfs for the Sound Watershed Consulting (SWC) analysis. Because the SWC analysis excluded flows between 200 and 373 cfs, their results for the most frequent (smallest magnitude) events are skewed toward higher values. For example, the SH&G analysis suggests the 1.5-year streamflow is 336 cfs, while the SWC analysis indicates it as 492 cfs. The cited partial duration series include both rain-on-snow and snowmelt flows, since they have similar flood hazard importance. Sorted statistical analysis of rain-on-snow versus snowmelt streamflows is useful in understanding the relatively large geomorphic role that less frequent rain-on-snow events have on channel form and function.

SH&G conducted hydraulic modeling of existing conditions within the study area in the HEC RAS computer program, using the peak flows shown in Table 3.3-3 (SH&G 2004b:11). The peak flows used in the flood model vary slightly from, but are within the range of, the statistical values described above (Table 3.3-2). Cross sections used in the flood model were developed from a 1-foot LIDAR contour map using HEC-GeoRAS (SH&G 2004b:11). The model covered the area between the U.S. 50 crossing at Elks Club Drive (beginning roughly 82 feet downstream of the bridge crossing) to just upstream of the Lake Tahoe Golf Course hole 6 bridge. The modeled reach was roughly 8,000 feet in total length and incorporated California Department of Transportation (Caltrans) as-built plans for the U.S. 50 bridge geometry.

Table 3.3-3
Peak Flows Used in the SH&G HEC RAS Models

Recurrence Event	Flow (cfs)
1.5-year	370
5-year	1,171
10-year	1,828
50-year	3,415
100-year	6,183

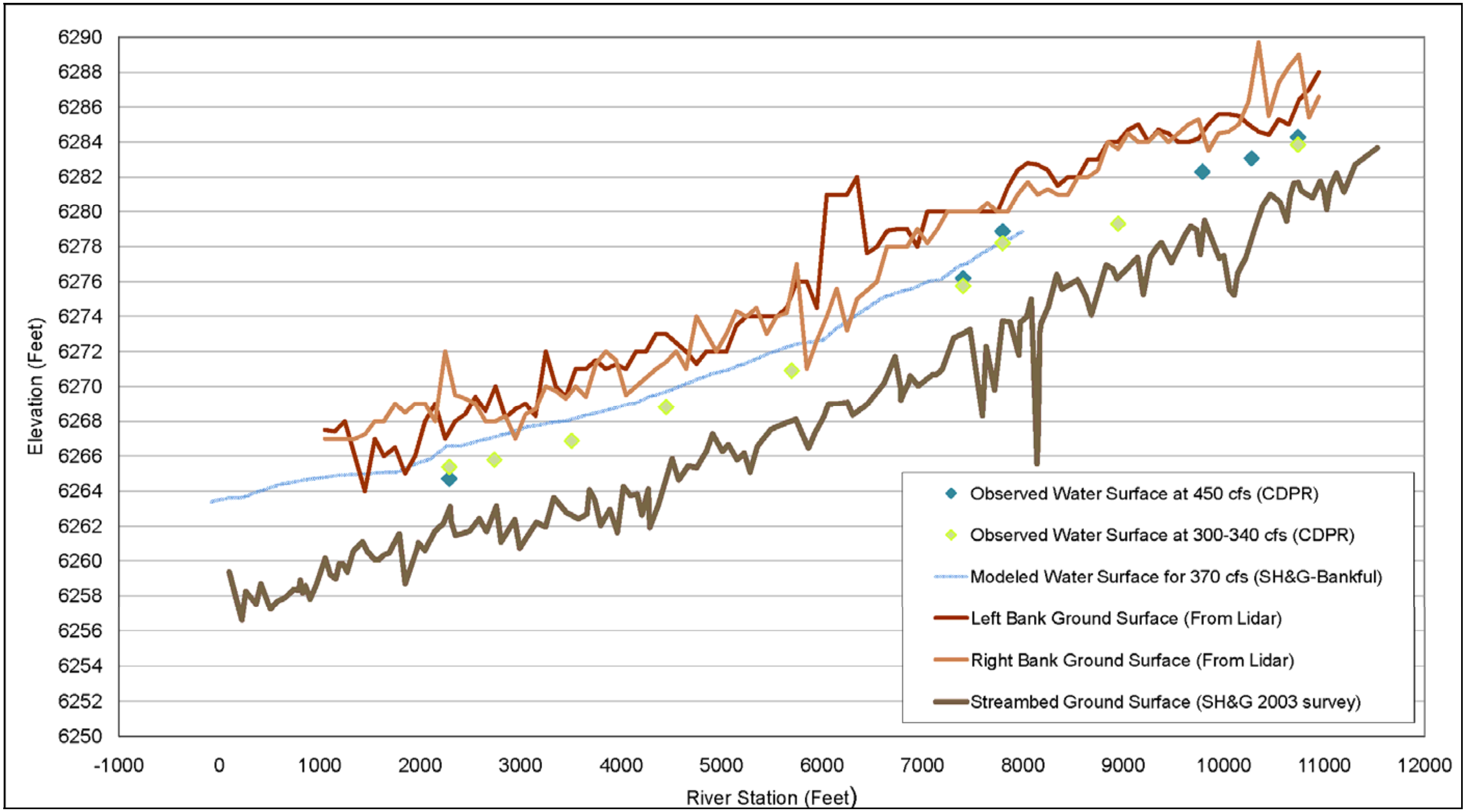
Source: Data compiled by VM Consulting in 2009

Overbanking and Active Floodplain

Under existing conditions, Upper Truckee River overbank flooding is limited within the study area, and the active floodplain is relatively narrow except near the confluence of Angora Creek where the floodplain is shared (Exhibit 2-3). Field observations of Upper Truckee River water levels by State Parks staff members during streamflow events and modeled Upper Truckee River water levels under particular streamflows by SH&G (2004a) provide information to describe the extent and location of overbanking in the study area (Exhibits 3.3-11 and 3.3-12).

Functional alluvial streams under snowmelt hydrology typically experience overbanking nearly every year, often expressed as the 1.5-year recurrence interval streamflow, or the geomorphic bankfull flow. The 1.5-year streamflow for the study area has been estimated by various studies as ranging between 370 and 500 cfs (see Tables 3.3-2 and 3.3-3).

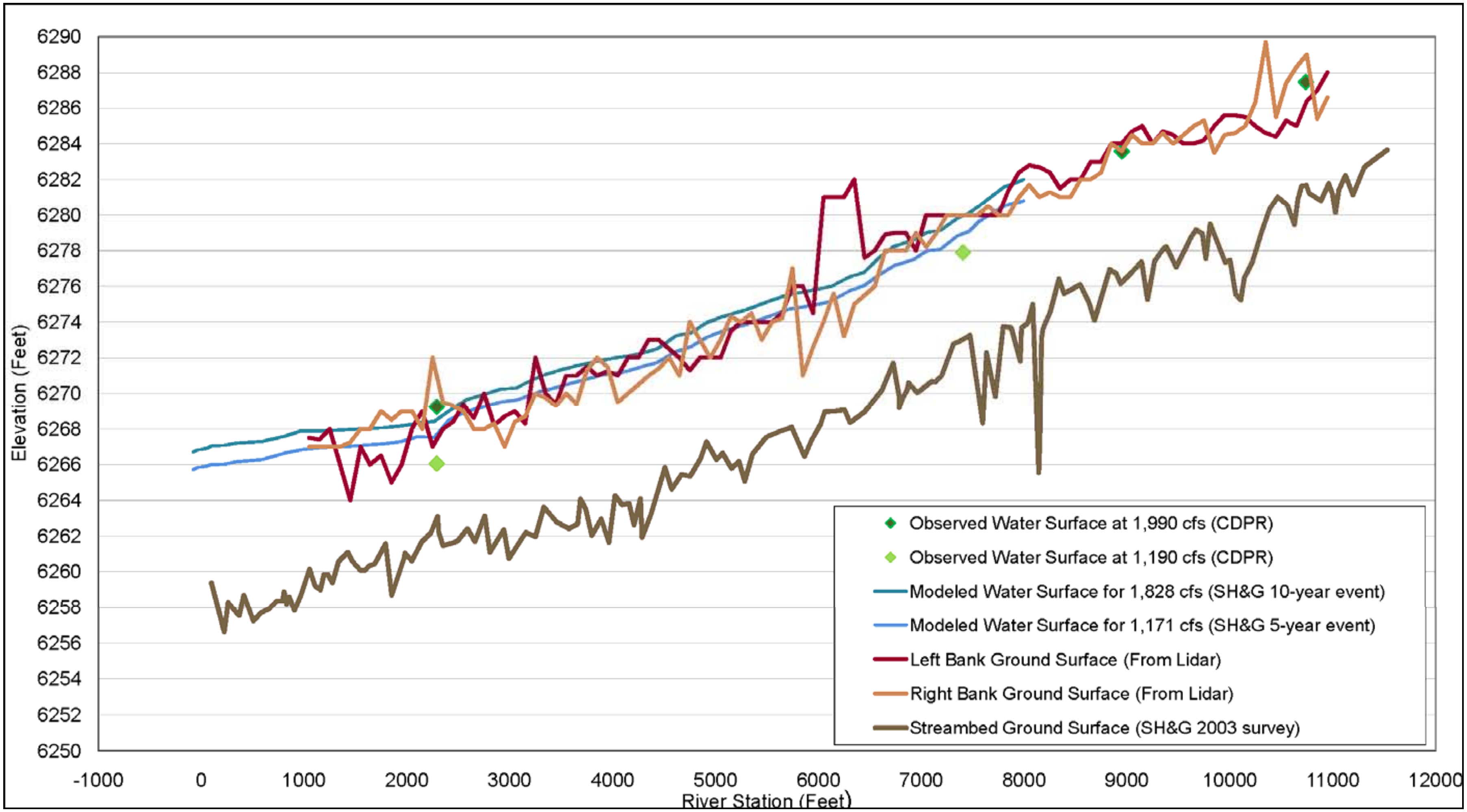
For small, frequent streamflows around 300–450 cfs (from a little less than to the mid-range of the estimates for the 1.5-year event and/or the natural geomorphic bankfull), available hydraulic modeling and field observations indicate that the Upper Truckee River water surface remains well below the existing streambanks throughout nearly all of the study area (Exhibit 3.3-11). This is because the channel is incised, with enlarged width and depth.



Source: SH&G 2004b, data from State Parks

Observed and Modeled Water Surface Elevations in the Project Reach of the Upper Truckee River for Frequent Streamflows near Natural Geomorphic Bankfull (300–450 cfs)

Exhibit 3.3-11



Source: SH&G 2004b, data from State Parks

Observed and Modeled Water Surface Elevations in the Project Reach of the Upper Truckee River for the 5-Year to 10-Year Peak Streamflow Events (1,171–1,990 cfs)

Exhibit 3.3-12

None of the observed water surfaces reach top of bank. The modeled water surfaces reach top of bank only in a couple of isolated locations: at the left bank near RS 1500 to 2000 and on the right bank near RS 3000 and RSs 5800–6300. SH&G (SH&G 2004a:III-28) estimated that more than 800–1,200 cfs would be needed to create overbanking, which greatly exceeds the 1.5-year peak flow. Field observations of a low, discontinuous, vegetated floodplain surface at an elevation associated with flows on the order of 350–450 cfs (SH&G 2004a, River Run Consulting 2006) support a conclusion that the geomorphic bankfull flow overbanks only in the main incised channel onto the narrow inset floodplain between terrace banks and not onto former floodplain on the main valley floor. The enlarged channel capacity and high banks prevent overbanking at flow magnitudes that would reach the top of bank in a functional channel, thus floodplain function along the Upper Truckee River within the study area is degraded.

SH&G initially estimated the existing channel capacity at three sites in the study area as roughly 600–800 cfs (SH&G 2004a:III-28), which implies that overbanking might occur approximately every 2–4 years. However, for streamflows that approximate the 5-year event, the modeled Upper Truckee River water surface (at 1,171 cfs) is above banks in several locations, but the observed water surface (at 1,190 cfs) was not above banks and the modeled surface is still confined by high streambanks along much of the reach (Exhibit 3.3-12). The modeled water surface for the 5-year event exceeds the top-of-bank elevation in much of Reach 2 and several portions of Reach 1, although it is below the bank in Reach 3. However, the modeled surface overestimates the water elevation relative to the observed water surfaces, as the water is observed to remain confined within the terrace banks relative to the model estimates. Overbanking would be expected throughout the entire study area for a 5-year event if the floodplain and channel connection was functional.

For streamflows that approximate the 10-year event, the modeled Upper Truckee River water surface (at 1,828 cfs) is above banks for several subreaches, but the observed water surface (at 1,990 cfs) is not consistently above banks and the modeled surface is confined by high streambanks in a few locations (Exhibit 3.3-12). Overbanking would be expected throughout the reach for a 10-year event if the floodplain and channel connection was functional. The channel capacity of the existing enlarged channel appears to limit overbank flows throughout most of the study area to events with peak flow magnitudes between the 5- and 10-year events (e.g., approximately 1,500 cfs). This is a substantially degraded condition relative to a stable functioning stream channel that would overbank every year or two.

Bridge Effects

The Upper Truckee River bridge at U.S. 50 near Elks Club Drive constricts the flow of the river through the study area, producing a high-velocity scour effect under the bridge and a low-velocity backwater and sedimentation effect upstream of the bridge. The results of hydraulic modeling indicate that the bridge strongly controls water surface elevations for a distance of up to 2,500 feet upstream when flows are greater than the 10-year event (SH&G 2004b:11). The bridge backwater effect is evident in the field during high flows and is further indicated by the remaining large sediment bars near the upstream end of the backwater effect (SH&G 2004b:11).

Historically, the U.S. 50 crossing of the Upper Truckee River has had various locations, orientations, widths, and lengths, resulting in a range of effects on the river. The original bridge was built in 1936. Scour problems along the north abutment were reported first in August 1954, and riprap was placed in June 1959. Scour was reported around both piers in 1963, and the channel was further modified and graded at the time of a bridge widening in 1969 (Stantec Consulting 2006:1.1). The bridge was again widened in 1995 to the present deck width of 55.5 feet and span of 161.5 feet, with supports skewed 11 degrees to improve their alignment to channel flow (Stantec Consulting 2006:1.1).

The 1991 hydraulic analysis for design of the 1995 bridge replacement used a 100-year flow of 5,200 cfs and called for the soffit (i.e., underside of the bridge deck) elevation to be 6,268.77 feet, to leave sufficient freeboard above the modeled 100-year water surface of 6,266.9 feet (Stantec Consulting 2006:1.1). The design modeling for the bridge replacement estimated the 100-year water surface elevation lower than FEMA's modeled 100-year water surface elevation of 6,269.5 feet in the same general area.

A more recent hydraulic analysis of the same location was conducted in support of a proposed bicycle and pedestrian bridge (i.e., the Sawmill Bike Path Project). The same flows developed for the previous Caltrans study were used, a 50-year flow of 4,565 cfs and 100-year flow of 5,677 cfs; and the resulting water surface elevations were 6,266.74 and 6,267.66 feet, respectively (Stantec Consulting 2006:E.1). The water surface elevation for the 100-year flood, as modeled for bridge design, was slightly lower than the 6,269.5-foot FEMA estimate.

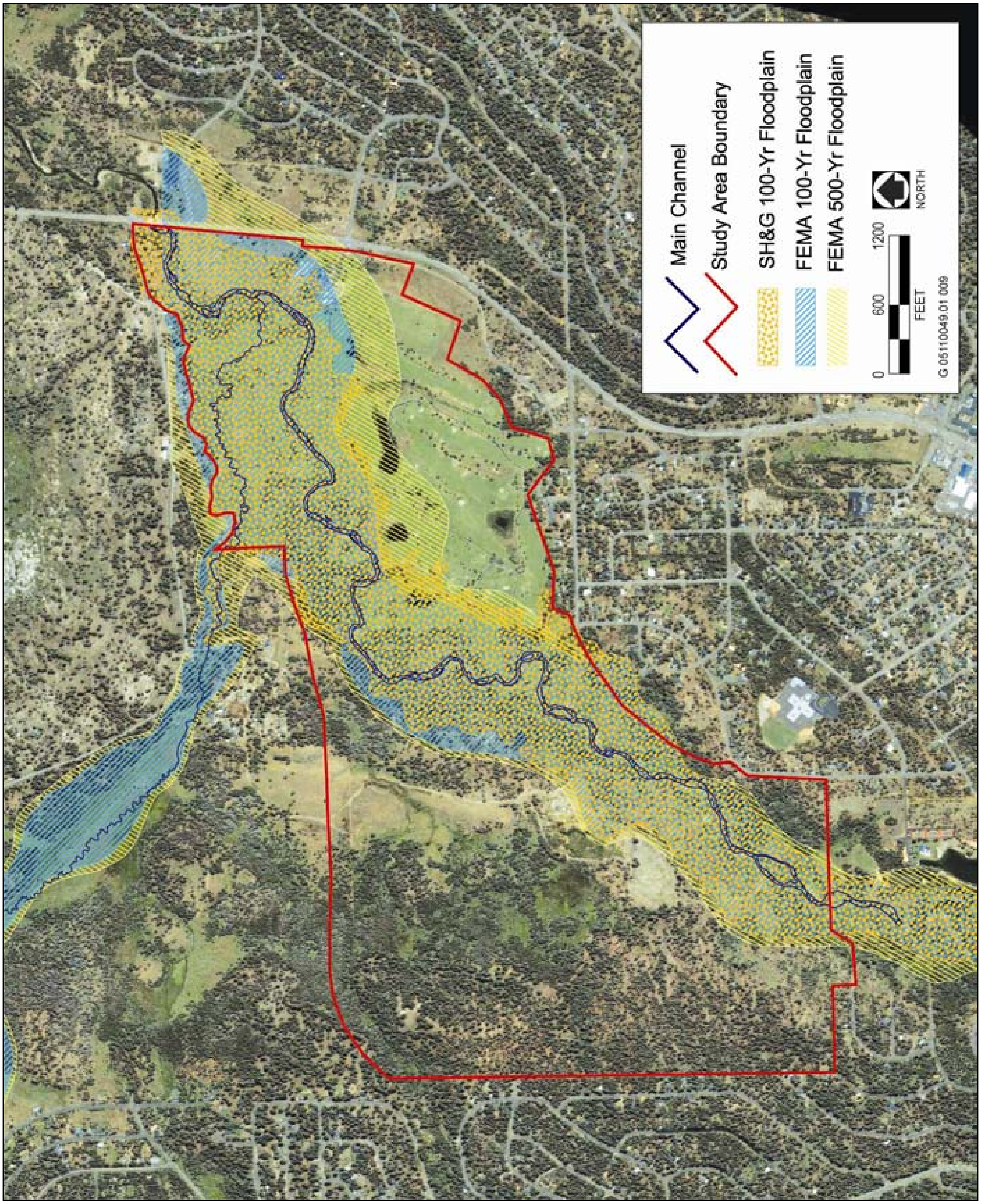
In addition to the U.S. 50 bridge at Elks Club Drive, five smaller golf cart bridges cross the Upper Truckee River within the study area. These bridges are generally undersized and restrict flood flow capacity, raising water levels upstream of each bridge. The undersized bridges also cause local channel erosion, which has necessitated extensive maintenance (River Run Consulting 2006:19). The bridges at holes 6 and 7 have caused the most serious problems, and several channel protection measures have been implemented over the years in response to damaging erosion and infrastructure threats. Flood events have damaged irrigation supply lines attached to golf course bridges (Stanowski, pers. comm., 2008). The treatments have been localized measures and primarily restricted to bank protection. They have not alleviated long-term or areawide flood affects. Hydraulic analysis of the golf course bridges has been conducted as part of preliminary project alternatives studies (SH&G 2004c). The existing hole 6 bridge is 45 feet long, and the hole 7 bridge is 75 feet long (it was replaced in the mid-1990s). Both are undersized and contribute to local downstream scour and bed and bank instability. The hole 6 bridge causes significant upstream backwater and functions as a grade control (SH&G 2004c:9).

Flood Hazards

Hazardous flooding that may affect structures, infrastructure, or persons is typically limited to relatively large events, with a regulatory focus on major flooding associated with the 100-year event. Although infrequent, the larger rain-on-snow flood events occur often enough to have significant geomorphic consequences. Large rain-on-snow flood events occurred on the Upper Truckee River in 1955, 1963, 1965, and 1997 (River Run Consulting 2006:10). The January 1, 1997, rain-on-snow event rapidly melted the snow (SH&G 2004a: III-2) and produced a record peak flow of 5,120 cfs. This flow was 70 times the average annual streamflow at the Meyers gauge (USGS #103366092) and resulted in substantial bank erosion and channel incision in many areas along the Upper Truckee River.

Past actions along the Upper Truckee River corridor have modified the 100-year floodplain boundaries, storage capacity, and/or flow directions, including: placement of fill for road crossings and other transportation facilities (e.g., U.S. 50 road fills, City Airport); placement of fill and/or structures for residential, commercial, or other uses (e.g., Tahoe Island area, Elks Club, Grocery Outlet, Carrows); and/or removal of floodplain area by levee protection for residential, commercial, or other uses (e.g., Tahoe Keys). These actions occurred primarily several decades ago, before regulations regarding floodplain management. However, the result of historic actions has been to degrade the 100-year floodplain storage capacity and flow routes relative to natural conditions. Floodplain capacity and flow routes in specific reaches may affect those in adjacent reaches, and for the 100-year event these effects have influences in both upstream and downstream directions.

A substantial portion of the study area, mostly along the Upper Truckee River and Angora Creek corridors and through sections of the golf course, is within the FEMA 100-year floodplain, as shown by the recently updated FEMA September 2008 FIRMs (Panels 06017C0632E and 06017C0369E) (FEMA 2008) (Exhibit 3.3-13). Because most of the study area is used as a golf course, there are minimal structures, with the exception of the golf course bridges, within the 100-year floodplain. Within and adjacent to the northeastern end of the study area, a few homes and structures are located along the south side of Sawmill Road, within the 100-year FEMA floodplain. According to the recent 2008 FEMA map, a portion of the golf course clubhouse on the northwest end is located within the periphery of the FEMA 100-year floodplain. An engineer’s drawing prepared during the time the golf course clubhouse was being proposed showed the 100-year flood boundary elevation as 6,272 feet National Geodetic Vertical Datum (NGVD) and delineated its location in reference to the proposed building footprint using the 1983 FEMA map (Haen, pers. comm., 1991). Given that the 100-year base flood elevations are very similar between the 1983 and 2008 FEMA maps once the conversion from NGVD to North American Vertical Datum (NAVD) 88 is



Source: SH&G 2004b, FEMA 2008

Modeled and Regulatory 100-Year Floodplain in the Study Area **Exhibit 3.3-13**

done, it is likely this same condition still holds true. With clubhouse finished floor elevations in the areas of interest at approximately 6273.8 feet (assuming NGVD), it appears that the building elevations remain above the 6,272 feet NGVD floodplain elevation, as accepted at the time of clubhouse project approval.

The SH&G modeling of the 100-year flood boundary is similar to the FEMA modeled floodplain (Exhibit 3.3-13), with some discrepancies along the edges, likely due to greater accuracy afforded by using the detailed LIDAR topography. For example, the FEMA 100-year floodplain covers a slightly wider section in the northeast section of the study area, whereas the SH&G-modeled 100-year floodplain includes additional area to the south in the more central portion of the study area. A much smaller section of the clubhouse is within the SH&G-modeled 100-year floodplain, as on the 2008 FEMA FIRM.

The FEMA base flood elevations in the study area range from approximately 6,270 feet NGVD (6,274 feet NAVD) roughly 150 feet upstream of the U.S. 50 crossing, to approximately 6,280 feet NGVD (6,284 feet NAVD) 6,500 feet upstream. Where the FEMA 100-year and SH&G-modeled 100-year flood areas overlap, the SH&G 100-year elevations are similar to the FEMA elevations (i.e., within approximately 1 foot).

Water Supply and Use

Water supply for the clubhouse, maintenance facilities, and all other potable uses in the study area is provided for fee by the South Tahoe Public Utility District. Only nonpotable uses are supplied from local surface water and groundwater sources (Stanowski, pers. comm., 2008).

Historically, a riparian surface water diversion (DWR #S015849) located near RS 2200 has been the primary source of golf course irrigation water. Only the first nine holes were irrigated during the first 5 years after construction; however, the entire 18-hole course has been irrigated for the past 43 years (Stanowski, pers. comm., 2008). The existing golf course has a total irrigated area of 119 acres, including 96 acres of intensively managed landscape areas (Table 3.3-4) and 23 acres of minimally managed landscape that receives irrigation more regularly than under the ideal definition due to the existing system conditions.

Table 3.3-4
Irrigated Areas at Lake Tahoe Golf Course

Landscaped Area*	Total (acres)
Intensively Managed	96
Minimally Managed*	23
Naturalized*	7
TOTAL	126

Note: * Intensively Managed areas include tees, greens, fairways, driving range, lawn, and rough. Minimally managed and naturalized areas are inadvertently overirrigated compared to their ideal management (as defined in Chapter 2) because of the existing irrigation system equipment.
Source: Data provided by State Parks in 2009

Channel conditions and shallow flow depths in the river have rendered surface water diversion difficult. During drought and/or some dry-season situations, a submersible pump is used to pull water from the Upper Truckee River during the day for temporary storage in the largest golf course pond (hole 9 pond) for irrigation distribution overnight (Stanowski, pers. comm., 2008). Non-potable water use, and therefore the quantity diverted from the Upper Truckee River, has not been documented historically. The maximum capacity of the existing submersible pump rate is 1,000 gallons per minute (gpm). Recent irrigation practices range from as early as 6 p.m. to as late as 10 a.m. (16 hours per day), which would equate to a maximum daily irrigation use of 960,000 gallons per day (approximately 2.95 acre-feet per day).

The irrigation system on the existing course is a combination of old pipes and lines that have been patched, repaired, and replaced as needed over the years (Stanowski, pers. comm., 2008). Irrigation lines within the front-nine greens have been repaired and replaced during the past decade; however, the remaining areas still have older lines with lower effectiveness and efficiency. Irrigation heads spray water a full 360 degrees with 90 foot throw distance, making it difficult to target water application (Walck, pers. comm.., 2009). Despite some of the system deficiencies, modern irrigation control and soil moisture monitoring are performed to help conserve water on the course (Lake Tahoe Golf Course and Restaurant 2000).

American Golf Corporation is developing an alternative irrigation supply using an on-site well. The intent would be to increase flexibility and maximum capacity while reducing the need to draw from the river under low-flow conditions. As of October 2008, the groundwater supply has been tested, and began operation during the 2009 irrigation season. Test yields of approximately 400 gpm have been typical, with a maximum of 600 gpm. The desired yield would be in the range of 450–500 gpm (Stanowski, pers. comm., 2008).

3.3.2 Environmental Consequences

Significance criteria

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of Federal, State, and local agencies. These criteria also encompass the factors taken into account under NEPA to determine the significance of an action in terms of the context and intensity of its effects. In development of mitigation measures for significant impacts of the project, effects on environmental threshold carrying capacities (thresholds) of the Tahoe Regional Planning Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Under CEQA, an alternative was determined to result in a significant impact related to hydrology if it would:

- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-or off-site;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- place housing within a 100-year flood hazard area as mapped on a Federal flood hazard boundary or FIRM or other flood hazard delineation map;
- place within a 100-year flood hazard area structures that would impede or redirect flood flows;

- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or

- expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact for hydrology and flooding if it would result in any of the following:

- changes in currents, or the course or direction of water movements;

- changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year, 1-hour storm runoff (approximately 1 inch per hour) cannot be contained on the site;

- alterations to the course or flow of 100-year flood waters;

- change in the amount of surface water in any water body;

- alteration of the direction or rate of flow of groundwater;

- change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations;

- substantial reduction in the amount of water otherwise available for public water supplies; or

- exposure of people or property to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches.

METHODS AND ASSUMPTIONS

The impact analysis examines the effects of each alternative over the short term and long term for each of the issues and topics listed above. Short-term effects are defined as those that would be temporary. Short-term, temporary effects are those that could occur over hours, days, or weeks during the active construction phase. In addition, the river system is expected to experience adjustments after construction, so the short-term, temporary analysis also looks at interim effects that might occur during the first few years after construction, assuming that streamflows are at least average, or until the first moderately large flood event (approximately 10-year peak flow).

The impact analysis has been performed using a combination of quantitative and qualitative methods. The analysis was performed by a hydrologist/geomorphologist and civil engineer experienced in river restoration in general and the Tahoe Basin environment, specifically. Information for the project site and vicinity and professional experience on similar projects was referenced and has been incorporated into the analysis of the river system history, existing conditions, likely future conditions, and conditions expected under each action alternative.

The results of hydraulic modeling of the study area and the initial alternatives, completed by SH&G, are incorporated into this impact analysis (SH&G 2004b). The hydraulic modeling by SH&G provides information about water surface elevations, boundaries of the inundation area, flow depths, and average velocity, allowing a comparison between existing conditions and a restored-channel alternative. The SH&G restoration alternative (SH&G Alternative # 4) assumed a longer, smaller channel and higher bed elevation than that proposed for this project under Alternatives 2, 3, and 5, but would have similar floodplain connectivity and overall design. Therefore, SH&G's modeling for the restoration alternative provides a conservative estimate of possible flood hazards from the proposed Alternatives 2, 3, and 5. The analysis of existing conditions conducted by SH&G is directly applicable to the analysis of existing conditions in this EIR/EIS/EIS; it also provides a suitable representation of flooding conditions under Alternative 4 because the river would remain in the present alignment, size, and elevation.

Effects of climate change on future hydrology are incorporated into the evaluation of the No Project/No Action Alternative (Alternative 1). However, even the most geographically and temporally focused available forecasts of climate change effects on hydrologic parameters (Tetra Tech 2007) are relatively variable and substantially uncertain. Therefore, the possible influences of various climate change scenarios, not just the core/central scenario, are considered in this analysis. The statements are expressed only in qualitative terms because of the degree of uncertainty and because the influences vary by scenario.

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Housing within a 100-Year Flood Hazard Area—The proposed alternatives would not place any new housing or buildings within the existing FEMA flood hazard area; therefore, no impact related to placing housing within a 100-year flood hazard area would occur.

Failure of a Levee or Dam—The study area is not within an identified dam-failure inundation zone or near any constructed levees; therefore, no flood hazard related to failure of a levee or dam would occur. Other possible changes related to flooding are fully discussed below.

Tsunami, Landslide, or Mudflow Risks—The study area is inland and in mountainous terrain remote from marine sources of tsunami hazards, and in an area without landslide/mudflow risks. Further, the site is located several miles from the shoreline of Lake Tahoe and at a high enough elevation to be protected from the possibility of seiche waves from the lake.

Short-Term Dewatering of Surface Water Features—Major construction activities would require temporary dewatering or bypassing of work areas along the Upper Truckee River, Angora Creek, and the unnamed creek. Although these activities may result in temporary changes to the amount of water in the surface water features of the study area, they would not result in any long-term changes to surface water. Hydrologic effects would be less than significant. Temporary dewatering and water diversion effects on biological resources are discussed in Section 3.5, "Biological Resources."

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.3-1 (Alt. 1)	Long-Term Increase in Stormwater Runoff Volumes. *Implementing Alternative 1 would not modify the existing golf course footprint, increase the amount of impervious surface, or directly modify the existing channels of the creeks, drainages, or the Upper Truckee River in the study area. Therefore, stormwater drainage patterns would not change and the volume of stormwater runoff would not increase relative to the existing condition.* No impact *would occur.*

Runoff volumes and peak-flow magnitudes generated in the study area differ from natural conditions because of past direct actions and the hydrologic response to those actions. Changes to runoff volumes and peak-flow magnitudes relative to natural conditions have occurred historically within the study area and in contributing watersheds. Comstock logging and urban development created widespread direct disturbance of soils and vegetation coverage, increasing runoff volumes and peaks. However, the counteracting effects of fire suppression and second growth of forests have moderated these changes, at least in undeveloped portions of the watersheds. The net effect of the historical actions and watershed recovery has been to create runoff patterns that differ from patterns in the undisturbed watershed; however, it is uncertain whether there has been a net adverse impact, because no records exist of runoff and peak flows before the 1960s.

Several past actions have affected runoff generation within the study area: temporary and long-term placement of fill material (e.g., historic road crossings, golf course topography for tees and greens), logging, pasture management, grazing, and fire suppression. Along the margins of the study area, urban development has directly modified natural soils and vegetation, increasing the total volume and rates of peak flows entering the study area from the local drainages.

Alternative 1 would not modify runoff volumes or peak flows generated on the site, but the effects of climate change could allow existing adverse conditions to worsen. The effects of climate change would modify runoff volumes and peak flows; however, uncertainty exists about the change in precipitation, which could produce a range of runoff responses when combined with various projected temperatures. The core scenarios predicted indicate that runoff (mean flows) in fall and winter would increase, while runoff in spring and summer would decrease. Although mean flows and total annual runoff might be similar to or less than existing flows and runoff under most climate change scenarios, peak flows from rainstorms and rain-on-snow events could be similar to or larger than existing peak flows. Under Alternative 1, the historical increase in impervious surfaces (for detailed discussion of coverage, see Impact 3.6-3 (Alt. 1) in Section 3.6, “Earth Resources”) and degraded soil and vegetation cover, and the resulting runoff generation and peak-flow conditions would not be modified. Therefore, the existing degraded conditions related to runoff volumes and peak-flow magnitudes would continue under this alternative. There would be no impact.

No mitigation is required.

IMPACT 3.3-2 (Alt. 1)	Long-Term Increase in Peak Flows Generated or Released Downstream*. Implementing Alternative 1 would not directly modify the peak flows generated within the study area or those released from the study area to downstream reaches of the Upper Truckee River. Natural channel adjustments to prior disturbances may eventually result in a minor reduction in peak flows released downstream during small to moderate floods. This impact would be* less than significant*.*

No increases in stormwater runoff volume would occur under Alternative 1 (Impact 3.3-1 [Alt. 1]), and the study area soils, vegetation, or stream channels would not be physically modified in a manner that would otherwise alter generation of peak flows. Therefore, no direct changes to the size of creeks and river channels in the study area would be made under Alternative 1. However, natural geomorphic trends suggest that under this alternative, the incised channel of the Upper Truckee River would continue to widen, with subsequent formation of inset floodplain in many areas of the project reach. Although this is limited in some areas by golf infrastructure, it might eventually provide some limited increased opportunity for overbank floodplain storage during small to moderate (1.5-year to 10-year) flood events, which could reduce the peak flow released downstream by a small but measureable amount. However, the surrounding terrace would not be reactivated as an enlarged active floodplain to facilitate more substantial reductions in peak flows released downstream. Additionally, little change in overbank floodplain storage during major peak-flow events (i.e., 25-year, 100-year events) would be expected under Alternative 1. Therefore, implementing this alternative would not result in an adverse increase in peak flows generated within the study area or discharged to downstream reaches of the Upper Truckee River. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-3 (Alt. 1)	Long-Term Increase in Overbanking during Small to Moderate Flood Events. *Implementing Alternative 1 would not directly modify the size or configuration of the Upper Truckee River channel or floodplain within the study area. Natural channel adjustments to prior disturbances may eventually provide some limited opportunity for increased frequency of overbanking onto a small active floodplain inset within the incised channel. This impact would be* ***less than significant****.*

The size and configuration of stream channels and floodplain in the study area would not be physically modified under Alternative 1. However, natural geomorphic trends suggest that under this alternative, the incised Upper Truckee River channel would continue to widen, with subsequent formation of inset floodplain in many areas of the project reach. Although this is limited by golf infrastructure, it could slightly increase the opportunity for overbanking during small to moderate (1.5-year to 10-year) flood events. However, the inset floodplain would remain isolated within the incised channel, between high terrace banks. No increase in overbanking frequency or expanded active floodplain area would affect the surrounding terrace. Only minor beneficial changes relative to the existing, degraded floodplain function would result, and those changes would be realized only after many more years of channel adjustment to past disturbances. The area and location of the active floodplain would remain similar to the existing conditions (Exhibit 3.3-14). This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-4 (Alt. 1)	Long-Term Increase in the 100-Year Flood Hazard Area or Elevation. *Implementing Alternative 1 would not directly modify the existing channel (size, shape, or location) or floodplain surfaces, and would not place new impediments within the FEMA regulatory floodway or floodplain. This alternative would not include any elements that could change the extent or elevation of the 100-year special flood hazard area as designated by FEMA. This impact would be* ***less than significant****.*

The existing streambank stabilization treatments would not be directly modified under Alternative 1, but the banks would be repaired as needed in response to flood events to protect infrastructure, natural resources, or private property. The potential repairs or replacement of bank treatments are assumed to have approximately the same dimensions and characteristics as the existing treatments, and the repairs would not make a measurable change in the river channel’s 100-year flow capacity or flow routes.

Under Alternative 1, the existing golf course bridges would not be replaced or relocated unless they are damaged by a flood or expected to fail. These undersized bridges, including the bridges by holes 6 and 7 (approximate RS 8200 and RS 7575), would continue to constrict flow during high flows, resulting in local streambed and streambank erosion. It is assumed that the channel would have either the same or more conveyance capacity if the bridges were repaired or replaced, and that bridge repair or replacement would not increase flow impediments or introduce new impediments. If these changes were to occur, they could locally modify the 100-year-flood water-surface elevation within the study area, but the downstream constriction at the U.S. 50 bridge would continue to limit the rate at which flood waters would be discharged downstream. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-5 (Alt. 1)	Long-Term Modification of Groundwater Levels and Flow Patterns. *Implementing Alternative 1 would not directly modify the size, shape, or locations of existing creek and river channels; alter the size, elevation, or uses of existing golf course ponds; or change soils or subsurface conditions throughout the study area. Alternative 1 would not include any element that could change groundwater levels or flow patterns, but minor changes would occur as the degraded channel continues to widen. This impact would be* ***less than significant****.*

The study area's existing groundwater levels and flow patterns have been modified by direct disturbance to the channel, the channel's natural geomorphic response through incision and widening, and the creation and maintenance of surface ponds for irrigation and drainage on the golf course. The degraded channel conditions have lowered groundwater levels relative to natural conditions, at least in the corridor adjacent to the incised channel. The degraded channel condition has also increased the seasonal fluctuation of groundwater levels throughout the natural floodplain by reducing the amount of overbanking for surface water recharge and increasing discharge (gradients) to the river channel. Conversely, the constructed and managed golf course ponds have supported groundwater levels locally by providing sources of diverted surface water (and pumped deep groundwater) at specific locations. Because the physical characteristics of the ponds and their water management would remain similar to existing conditions under Alternative 1, this artificial support of groundwater levels on portions of the terrace surface would continue.

Under Alternative 1, as the channel's natural adjustments cause the channel to widen, an associated retreat of groundwater would occur along the incised river channel, with possible increased discharge (loss) to the river and therefore from the ponds. The mixed effects of channel adjustments to past degradation and artificial groundwater support by the golf course ponds would continue under Alternative 1. This impact would be less than significant.

No mitigation is required.

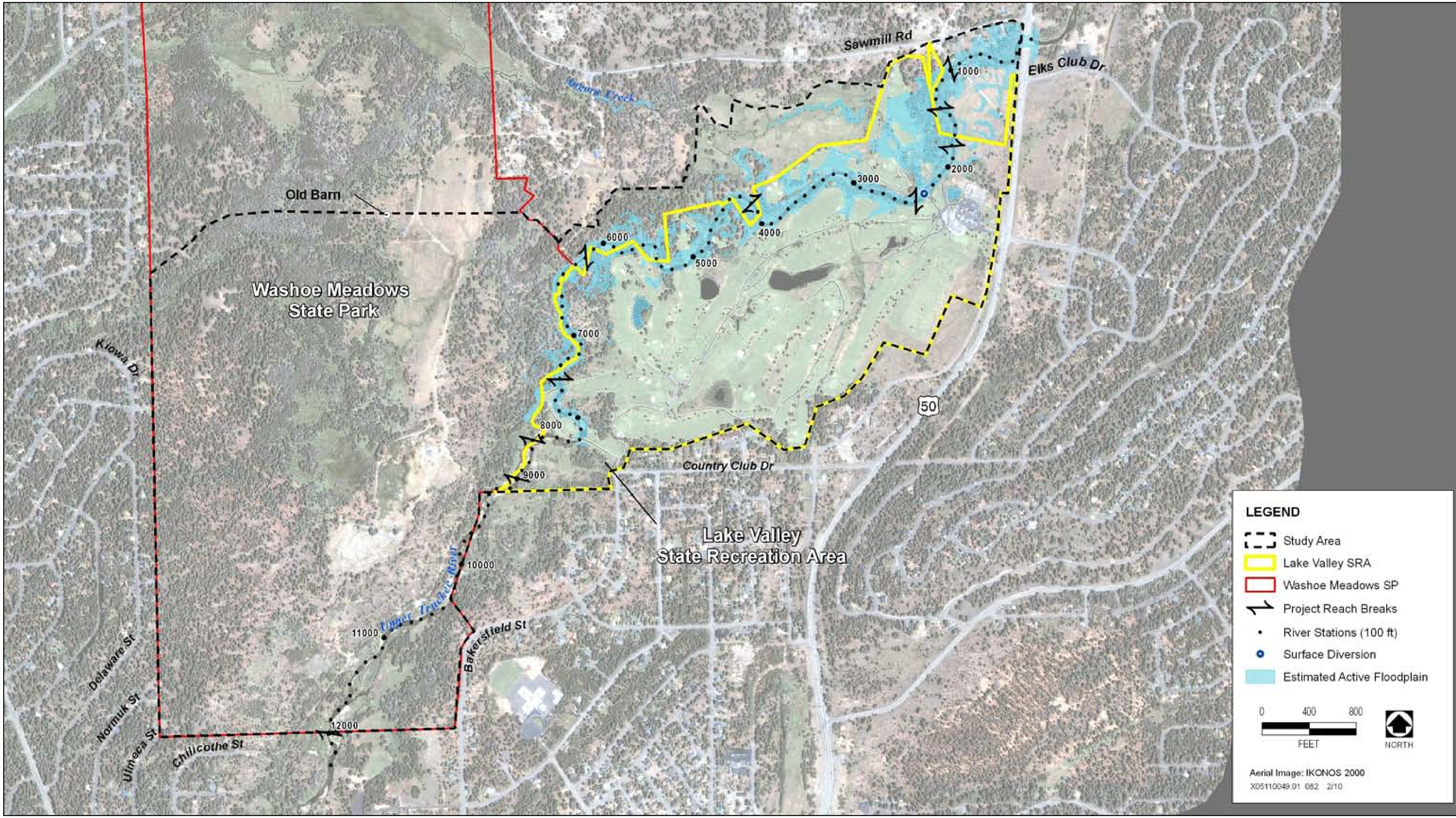
IMPACT 3.3-6 (Alt. 1)	Long-Term Increase in Irrigation-Water Demand. *Implementing Alternative 1 would not directly modify the existing demand for irrigation water by land uses within the study area, nor would it modify the use of surface water from the Upper Truckee River or from on-site groundwater wells. Demand for irrigation water in the study area would remain similar to existing demand. This impact would be* ***less than significant****.*

Existing acreage of irrigated land and the irrigation system in the study area would not be directly modified under Alternative 1. As under existing conditions, about 103 acres of the total footprint would be "intensively" managed landscape, with regular irrigation (except for 7 acres of hard coverage); 23 acres would be "minimally" managed landscape, and 7 acres would be "naturalized" landscape under Alternative 1. These landscape management categories are defined and described in Chapter 2 of this draft EIR/EIS/EIS. Although the descriptions of these categories indicate that only the intensively managed areas would be irrigated regularly, deficiencies exist in the existing irrigation network's physical characteristics and operational system, which prevents optimized water application. Therefore, at least some of the minimally managed and naturalized areas receive overspray irrigation under existing conditions. Piecemeal repairs of the irrigation network over time might eventually improve efficiency and reduce inadvertent irrigation of some of these areas, but no quantitative information is available about the area or timing of such improvements. Water demand for irrigation would remain similar to existing demand. This impact would be less than significant.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.3-1 (Alt. 2)	Long-Term Increase in Stormwater Runoff Volumes. *Implementing Alternative 2 would modify the golf course footprint, relocate and modify the type of impervious surfaces (including a new restroom and paving of unpaved parking area), and directly modify the existing channels of the creeks, drainages, and the Upper Truckee River in the study area. Changes to stormwater drainage patterns may occur within the new golf course footprint and in the areas of existing golf course to be restored. Storm drainage systems would be installed and upgraded within the new golf course footprint to locally provide increased detention and infiltration of runoff. At the conceptual level of design, it is uncertain whether storm drainage system features would be sized and located appropriately to prevent an increase in the amount of stormwater runoff released to the river or creeks in the study area. This impact would be* ***potentially significant****.*



Source: California State Parks 2008, data adapted by AECOM 2010

Estimated Active Floodplain: Alternatives 1 and 4 **Exhibit 3.3-14**

Alternative 2 would relocate and modify the type of impervious surface in the study area, including relocation of hard coverage from SEZ to Land Class 5, and 1b more distal from the river, replacement of soft coverage with hard coverage, and result in net removal of coverage. Some specific locations with impervious surfaces would include a new restroom, cart paths, and paving of the existing overflow parking. The study-area wide benefits of reduced and relocated coverage are described under Impact 3.6-3 (Alt. 2) in Section 3.6, "Earth Resources". There would be an overall increase in footprint area, but coverage within 100 feet of the river would decrease. However, the specific hydrologic effects of the changes in coverage type and locations within particular sub-watersheds within the Washoe Meadows SP and Lake Valley SRA have not yet been calculated given the conceptual level of design. It is possible that the volume of stormwater runoff generated within certain portions of the study area would increase relative to existing conditions.

Alternative 2 would incorporate stormwater improvements/routing and detention basins as part of the landscaping within the new golf course footprint on the west side of the river; however, the layout, specific features, and performance standards for all of the stormwater system have not yet been determined. In general, the sizing, location, and design of features would be expected to meet regulatory standards enforced by the Lahontan RWQCB and TRPA. Because it is uncertain whether storm drainage system features would be sized and located appropriately to prevent an increase in the amount of stormwater runoff released to the river or creeks in the study area, this impact would be potentially significant.

Mitigation Measure 3.3-1 (Alt. 2): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Damage from Increased Runoff Discharged to Creek or River Channels.

Stormwater improvements shall be incorporated into the final detailed project design. Before issuance of grading permits, State Parks shall submit a detailed stormwater drainage plan to El Dorado County and TRPA for review and approval. The plan shall identify the locations, sizes, and types of facilities used to retain and treat the runoff volumes and peak flows. The detailed design shall meet the following minimum performance criteria:

- Stormwater facilities shall be installed in the sub-watershed of each existing natural drainages (e.g., swales, seeps, creeks) that will experience project-related changes to topographic, soil, and/or vegetation cover;

- Peak runoff discharge from the stormwater system to each of the existing natural drainage swales, creeks, or the Upper Truckee River shall be equal or less than pre-project conditions up to the 10-year event;

- Nuisance perennial discharge of excess irrigation water shall be prevented; and

- Where rerouting of drainages or point discharges from the stormwater facilities are necessary, those discharges shall be designed to prevent streambed or streambank erosion in the receiving water body.

The stormwater designs and drainage plan shall strive to incorporate BMPs where feasible, including but not limited to:

- pervious pavement or pavers,
- strategically placed bioswales and vegetated swales,
- constructed wetlands and detention ponds,
- rock- or boulder-lined areas to prevent disruption or erosion, and
- training of maintenance personnel on stormwater pollution prevention measures.

With the measure described above, the stormwater system would be expanded and improved to meet specific performance requirements. Therefore, with implementation of Mitigation Measure 3.3-1 (Alt. 2), Impact 3.3-1 (Alt. 2) would be less than significant.

IMPACT 3.3-2 (Alt. 2)	Long-Term Increase in Peak Flows Generated or Released Downstream. *Implementing Alternative 2 has the potential to increase the peak flows generated within the portions of the study area where existing natural soils and vegetation would be converted to new impervious surfaces; however, the conceptual design includes stormwater detention features and expansion/upgrades to the stormwater system. In addition, the proposed modifications to the river channel and the enlarged active floodplain under Alternative 2 would result in a beneficial reduction in peak flows released to downstream reaches of the Upper Truckee River during small to moderate flood events. Major flood-peak flows released downstream would not be expected to change. This effect would be* ***beneficial****.*

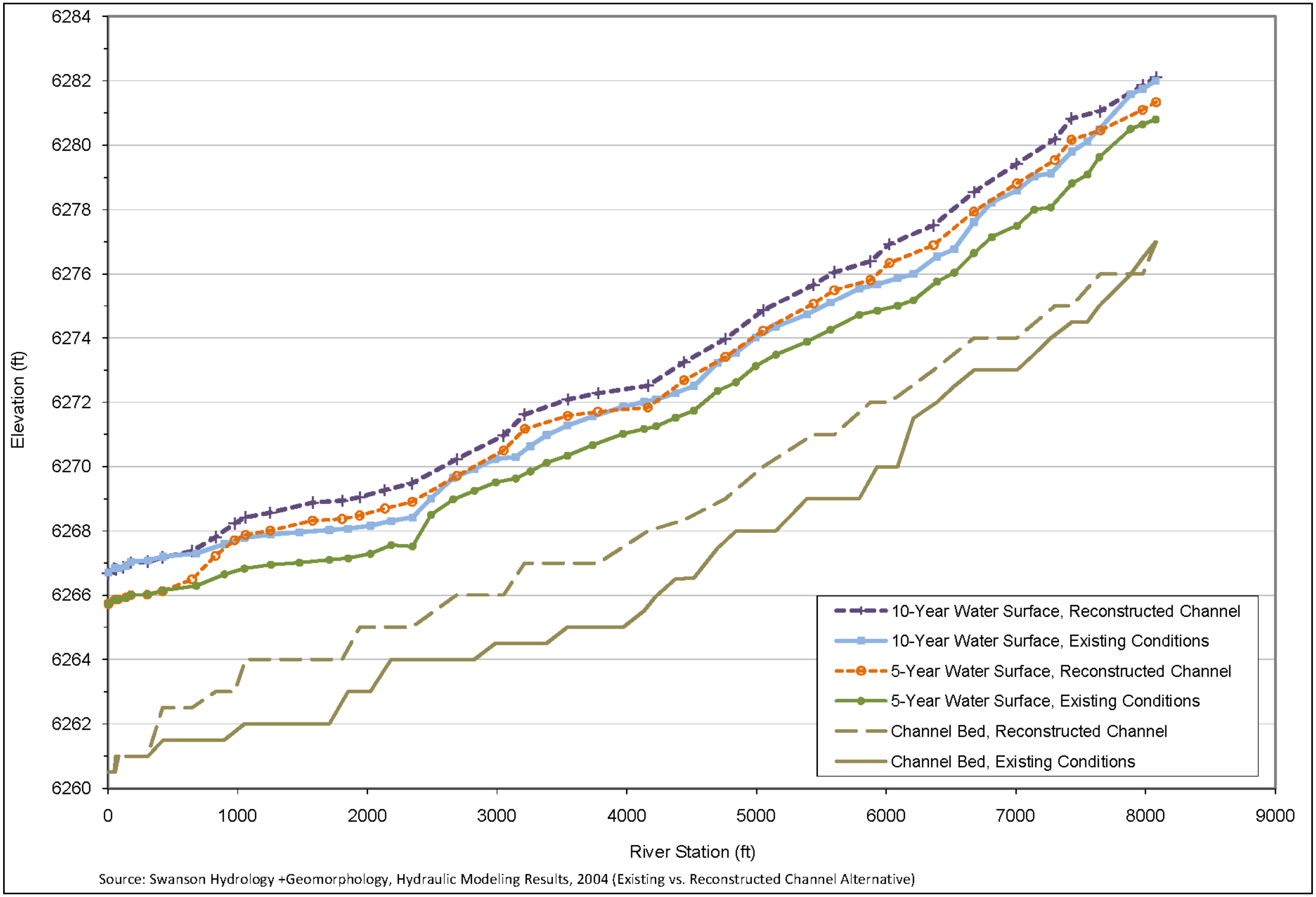
Under Alternative 2, generation of peak flows could increase within portions of the study area where existing natural soils and vegetation would be converted to new impervious surfaces, but stormwater drainage systems would be expanded and upgraded as part of the project and some existing impervious areas near the river would be restored. However, the project's conceptual-level design does not specify the size, location, or performance standards of the stormwater system for the new golf course, and unmitigated peak flows in some subbasins within the site might be greater than under existing conditions. The conceptual design does indicate that multiple stormwater ponds would be part of the proposed system, including a new pond on the west side of the river; therefore, it is expected that the final stormwater system would be able to detain and retain adequate runoff volumes to prevent increases in peak flows discharged to the creeks or river channels on-site. Implementing Mitigation Measure 3.3-1 (Alt. 2) as described above would also reduce the potential magnitude of a possible stormwater peak-flow effect within the site.

Of greater magnitude and importance for changes in peak flows are the beneficial changes to the stream channel's size and configuration and the enlargement of the active floodplain within the study area that would occur under Alternative 2. By increasing channel length (adding 1,590 feet), elevating the streambed 2–4 feet in many locations, and reducing channel capacity in a majority of reaches, implementation of Alternative 2 would increase opportunities for overbanking during small to moderate (2-year to 10-year) flood events. Along more than 9,000 feet of channel—the newly constructed sections, reconnected meanders, and modified existing channel—increased frequency of overbanking would be expected during small to moderate flood events. The improved floodplain connection would allow temporary spreading of peak flows entering the site from the upstream watershed and storage of a portion of the total flow. Under the restored channel conditions, the area inundated by the 5-year peak flow (i.e., the active floodplain) would increase from 36 acres to as much as 77 acres, and the area inundated by the 10-year flood would increase from 61 acres to as much as 99 acres (Exhibit 3.3-15). The volume of peak flows discharged from the site downstream along the river during small to moderate floods would be reduced because additional temporary storage would be available for shallow slow-moving water on the enlarged floodplain.

Implementing Alternative 2 would not modify the configuration or capacity of the U.S. 50 bridge across the Upper Truckee River. The bridge's restrictive effect on river flows discharged downstream during moderate to large events (e.g., 10-year to 100-year peaks) would not be modified. Therefore, peak flows released downstream during moderate to large flood events would not be expected to change. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-3 (Alt. 2)	Long-Term Increase in Overbanking during Small to Moderate Flood Events. *Implementing Alternative 2 would directly modify the size and configuration of the Upper Truckee River channel within the study area to increase the frequency of overbanking onto portions of the surrounding terrace, thus enlarging the active floodplain. Natural channel adjustments would increase the frequency of overbanking onto a small active floodplain, inset within the sections of existing incised channel that would be retained as part of the active channel. This effect would be* ***beneficial****.*



Source: SH&G 2004b

Water Surface Profiles for the 5-Year and 10-Year Flood Events under the SH&G Restored-Channel Alternative versus Existing Conditions **Exhibit 3.3-15**

The stream channel’s size, configuration, and floodplain connection would be directly modified throughout the study area under Alternative 2. By increasing channel length (adding 1,590 feet), elevating the streambed by 2–4 feet in many locations, and reducing channel capacity in a majority of reaches, implementing Alternative 2 would increase opportunities for overbanking during small to moderate (2-year to 10-year) flood events. Along 9,000 feet of channel—the newly constructed sections, reconnected meanders, and modified existing channel is expected to provide increased frequency of overbanking during small to moderate flood events. As a best-case estimate, the restored-channel alternative modeled by SH&G (see “Methods and Assumptions”) shows a detectable increase in water surface elevation, relative to existing conditions, that begins about 700 feet upstream of the U.S. 50 crossing at the Elks Club and extends throughout the project reaches (Exhibit 3.3-15).

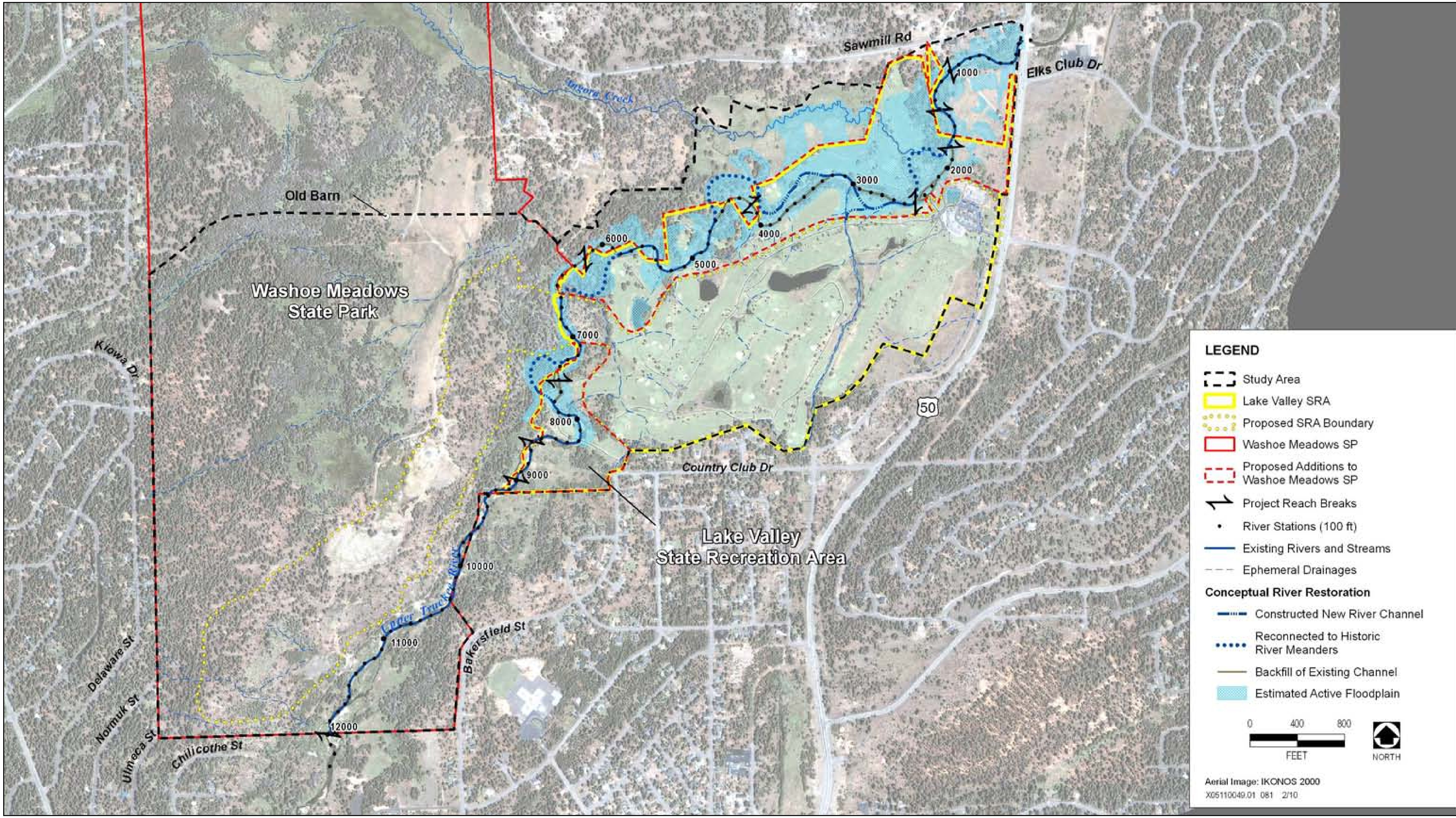
A substantial increase in water surface elevation of up to 1 or 2 feet along much of the restored channel could occur under the 10-year event under Alternative 2. The 5-year peak-flow water surface elevation could increase to approximately the level of the existing 10-year water surface elevation. Channel modifications in reconnected and constructed meanders, excavation of approximately 1.7 acres of inset floodplain, and subsequent adjustments to the natural channel throughout the project reaches would expand the active floodplain area by up to 41 acres for the 5-year peak flow (Exhibit 3.3-16) and the area inundated by the 10-year peak flow by 38 acres (Exhibit 3.3-17). These measurable, substantial beneficial increases in floodplain connectivity and function relative to the existing, degraded floodplain function would be realized on project completion. These changes would be beneficial relative to existing overbanking conditions, and Alternatives 1 and 4. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-4 (Alt. 2)	**Long-Term Increase in the 100-Year Flood Hazard Area or Elevation.** *Implementing Alternative 2 would directly modify the size and configuration of the Upper Truckee River channel within the study area, which could allow the water surface elevation for the 100-year flood to increase or the boundary of the 100-year floodplain to expand. The expanded floodplain would be contained within open space areas and not include any residential areas. Nonetheless, because an increase in flood elevation and/or floodplain would occur, this impact would be* **potentially significant**.

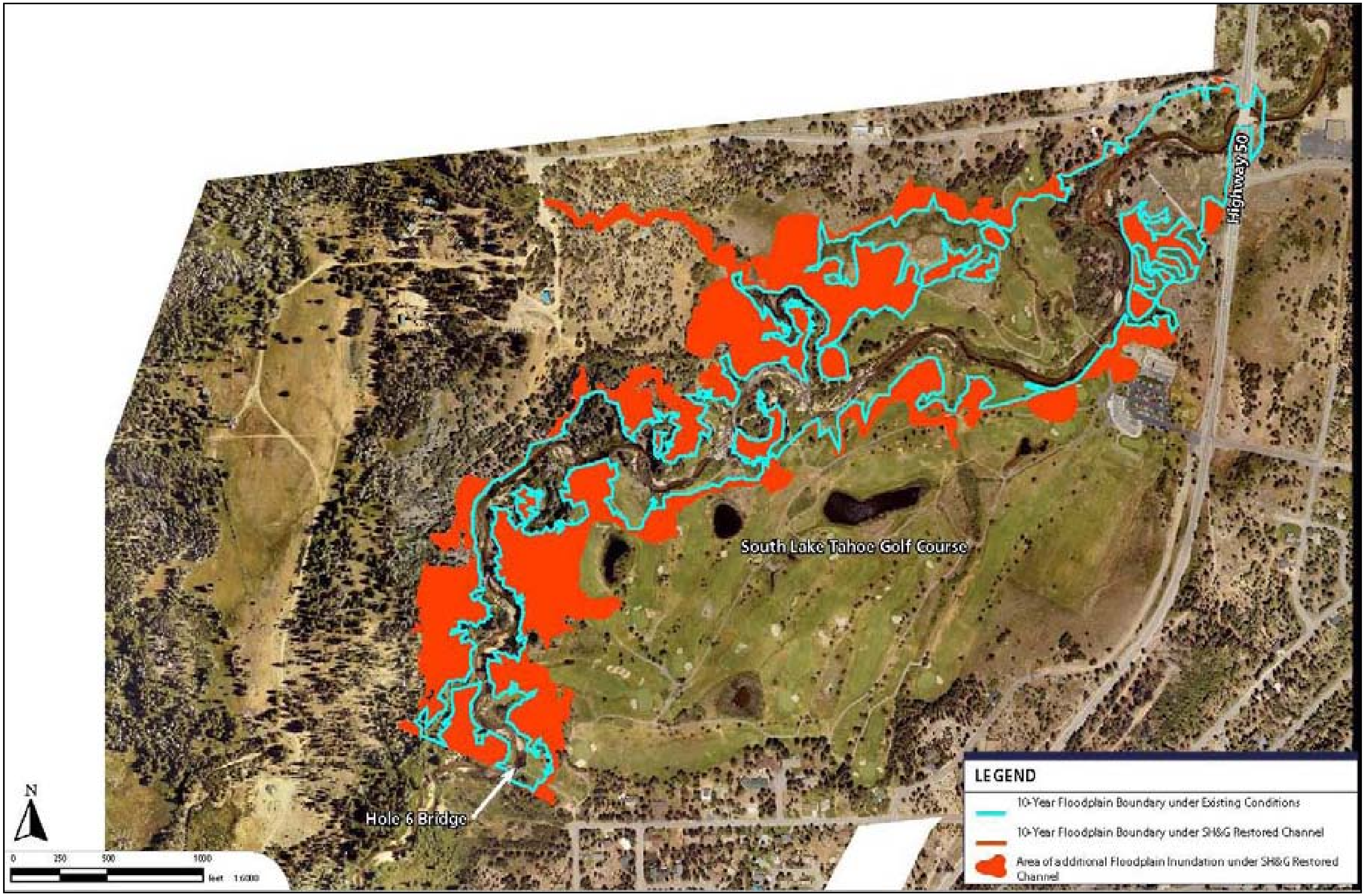
The stream channel’s size, configuration, and floodplain connection would be directly modified throughout the study area under Alternative 2. By increasing channel length (adding 1,590 feet), elevating the streambed by 2–4 feet in many locations, and reducing channel capacity in a majority of reaches, implementing Alternative 2 may increase the elevation of the water surface and/or the area inundated by large (i.e., 100-year) flood events. For this potentially hazardous risk, the results of the hydraulic modeling for the SH&G restored-channel alternative were used to provide a conservative estimate of the potential change. The smaller channel capacity (i.e., 370 cfs versus 550 cfs) and higher streambed profile assumed in the analysis of the SH&G restored-channel alternative serve to allow a worst-case estimate of potential changes to the 100-year flood elevation from Alternative 2.

Under existing conditions, the broad valley of relatively level topography provides a large storage area for water from the 100-year flood event to disperse across the terraced surface, and the U.S. 50 bridge crossing by the Elks Club is a constriction that limits the rate of release downstream during major flood events. These factors would not change under Alternative 2, and there would be essentially no change in the margin of the 100-year floodplain along approximately 1,800 feet of the most downstream reach of the project (Exhibit 3.3-18). The channel modifications under Alternative 2 may, however, enlarge the boundaries of the 100-year floodplain farther upstream, primarily on the east edge within the present golf course and at a few locations along the west edge of the potential inundation area. The 100-year floodplain area could expand by as much as 39 acres. A comparison of the modeled water surface profiles (Exhibit 3.3-19) indicates that a detectable increase from the existing water surface profile may begin about 1,000 feet upstream of the U.S. 50 crossing at the Elks Club, and increase to more than 1 foot between about 3,000 feet and 7,000 feet upstream.



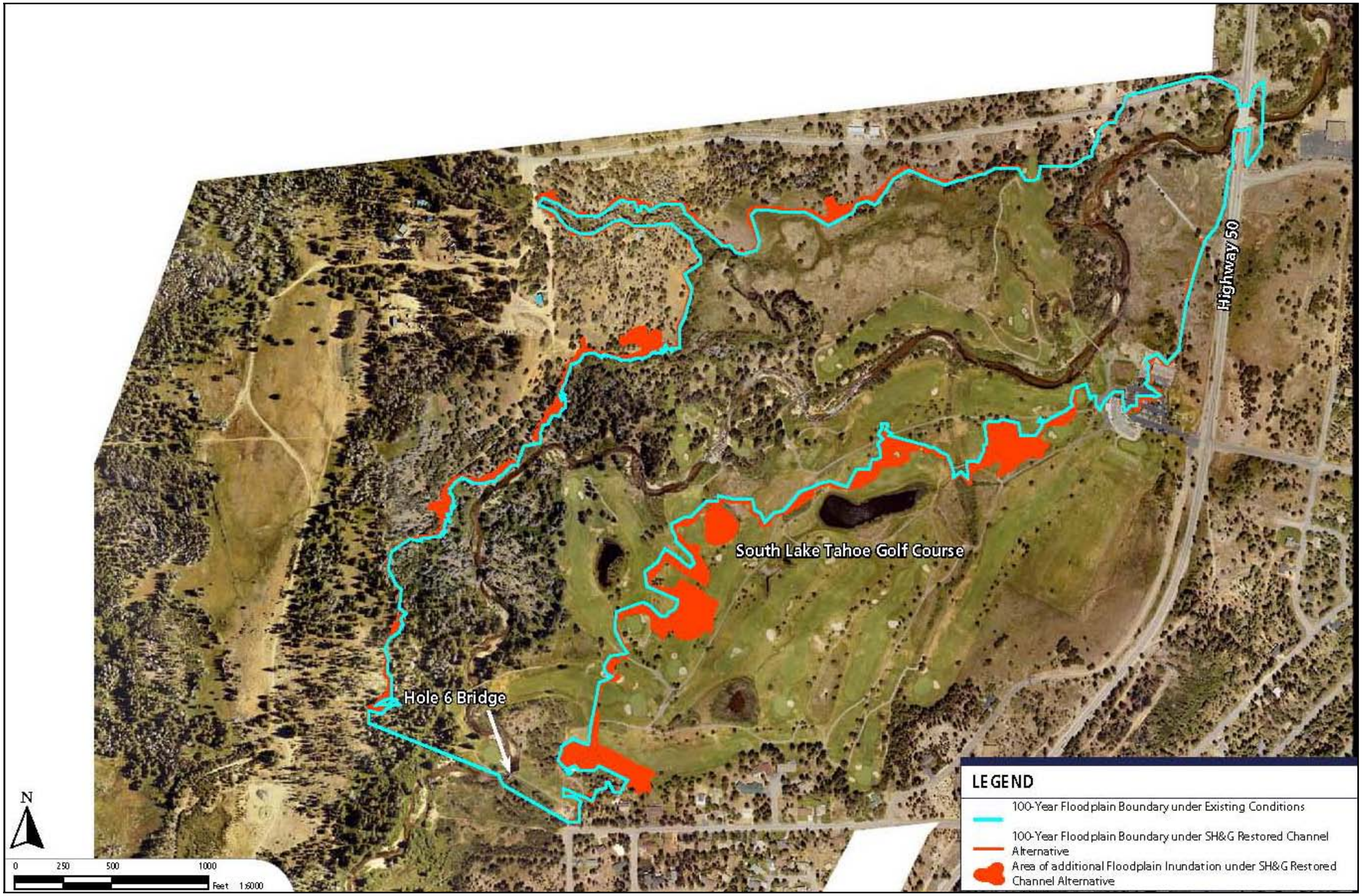
Source: California State Parks 2008, data adapted by AECOM 2010

Estimated Active Floodplain: Alternatives 2, 3, and 5 **Exhibit 3.3-16**



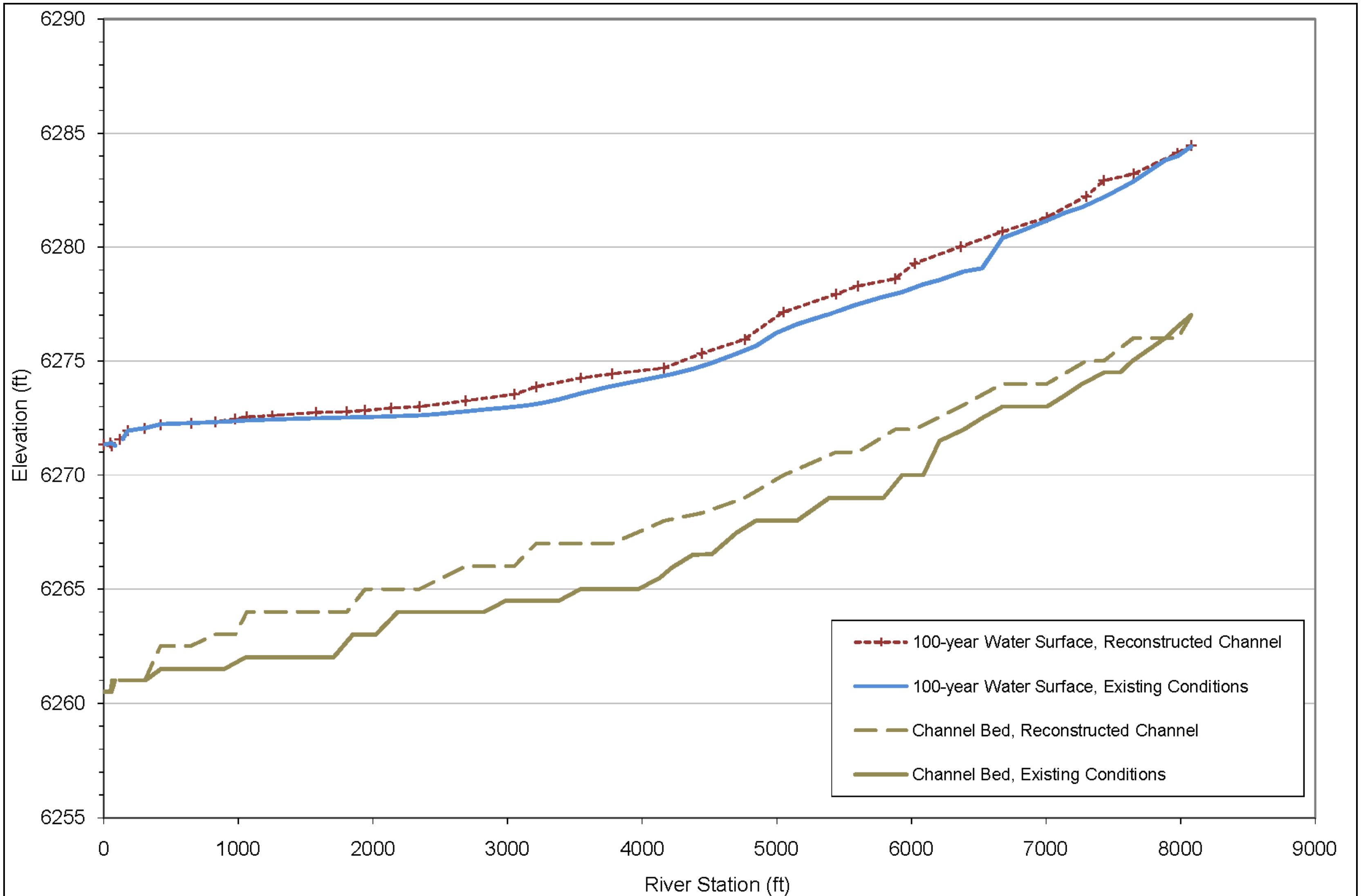
Source: SH&G 2004b

Boundaries of the 10-Year Floodplain under the SH&G Restored-Channel Alternative versus Existing Conditions **Exhibit 3.3-17**



Source: SH&G 2004b

Boundaries of the 100-Year Floodplain under the SH&G Restored-Channel Alternative versus Existing Conditions **Exhibit 3.3-18**



Source: Swanson Hydrology +Geomorphology, Hydraulic Modeling Results, 2004 (Existing vs. Reconstructed Channel Alternative)

**Water Surface Elevations for the 100-Year Flood Event
under the SH&G Restored-Channel Alternative versus Existing Conditions** **Exhibit 3.3-19**

The possible increased water surface elevations and potential enlarged floodplain boundaries for the 100-year event under Alternative 2 would not affect residential structures or major infrastructure features because the floodplain boundaries would be within open space and golf course portions of the study area. No changes to the water surface elevation for, or the location of, the 100-year flood event are expected in the vicinity of existing residential structures along Sawmill Road. In addition, detailed hydraulic modeling of the proposed design may indicate that the potential changes would be less substantial than indicated by these initial conservative modeling estimates. However, it remains possible that Alternative 2 may produce adverse changes to water elevations and inundated areas under the 100-year flood. This impact would be potentially significant.

Mitigation Measure 3.3-4 (Alt. 2): Prevent Detrimental Increases in the Future Water Surface Elevation or Area of the 100-Year Flood.

During design development of Alternative 2 beyond the conceptual planning stage, more precise hydraulic modeling of the proposed channel configuration shall be performed. The hydraulic modeling shall be used iteratively with the detailed design process to identify and incorporate modifications to final design that would achieve the following performance criteria:

- prevent increases in the future 100-year water surface elevation or inundation area as needed to avoid worsening flood hazards or potential damage to existing structures, residences, or public infrastructure.

Examples of design features that could be included in the final design through this iterative modeling/design process include:

- lowered final streambed elevation within the downstream transition from the treated reach to the existing unmodified channel;

- enlarged channel or overbank capacity within and/or downstream of the treated reach.

With the measure described above, design features would prevent any increase in hazards or risk of damage. Therefore, with implementation of Mitigation Measure 3.3-4 (Alt. 2), Impact 3.3-4 (Alt. 2) would be less than significant.

IMPACT 3.3-5 (Alt. 2)	Long-Term Modification of Groundwater Levels and Flow Patterns. *Implementing Alternative 2 would directly modify the size, shape, and location of existing creek and river channels; alter the size, elevation, or use of existing golf course ponds; change soils or subsurface conditions in the study area; and increase the potential for surface recharge within an enlarged active floodplain. In combination, these modifications would be expected to raise groundwater elevations along the river corridor and reduce seasonal variation in groundwater levels and gradients, and some artificial groundwater support would still occur in the location of golf course ponds. This effect would be* ***beneficial****.*

Implementing Alternative 2 would lengthen the channel, decrease its capacity, and raise the streambed within the reconnected meanders and new constructed channel and in the modified reaches of existing channel. It would also directly raise the ground surface in abandoned reaches of the existing incised channel by creating backfilled channel in restored floodplain areas. These direct effects would enlarge and raise the potential subsurface sediments suitable for groundwater storage, and improve the vertical and lateral groundwater connections throughout the study area. The improved connectivity would allow groundwater to flow across the location now interrupted by the deeply incised channel and reduce the rate of groundwater loss to surface water. The increased frequency of overbanking and increased active floodplain area would enhance opportunities for groundwater recharge, because surface water would be detained and spread over the active floodplain at least every couple of years and for a greater number of days per year for a given peak flow. These beneficial changes would be primarily centered along the proposed river alignment, and would especially improve the area adjacent to the existing river channel.

Under Alternative 2, changes would be made to some of the existing golf course ponds east of the river, and a stormwater pond would be added west of the river. The ponds currently located by holes 9 and 13/16 would likely be expanded by about 0.5 acre, via enlargement around the edges rather than deepening (Stanowski, pers. comm., 2009). The pond currently located by holes 14/15 would be backfilled and reshaped as part of floodplain restoration. The golf course ponds would continue to be used and managed for water supply and drainage. Only minor changes, if any, in groundwater levels or flow patterns east of the river would be expected because the retired pond by holes 14/15 would be within the reactivated floodplain and near a reconnected meander that would provide improved surface-water support.

West of the river, irrigated areas associated with the golf course would be expanded, tree cover would be reduced, and surface water features would be added for aesthetics and storm drainage under Alternative 2. Although it would not be the intent to overirrigate managed grasses, the net effect of the vegetation, irrigation, and drainage changes would likely trend toward improved recharge of local groundwater or support of groundwater levels. Other restoration efforts on the west side of the river would involve reconfiguring a portion of the old quarry pit floor that was cut into the hillside and intercepts groundwater. A more naturalized channel and wetland pond would be constructed. All these activities would improve conditions relative to the existing conditions of an increased rate of groundwater loss to the incised river channel. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-6 (Alt. 2)	**Long-Term Increase in Irrigation-Water Demand.** *Implementing Alternative 2 would directly modify the locations and total acreage of specific irrigated land uses within the study area. The physical and operational irrigation system would be expanded and modified. The net effect of the overall increase in the golf course footprint, reduction of intensively managed areas, and improved irrigation system would be to hold demand in the study area to a level similar to existing conditions. This impact would be* **less than significant***.*

Existing irrigated acreage and the irrigation system would be modified under Alternative 2. The total footprint of the golf course would expand from 133 acres to 156 acres, but the vegetation types and their management within the footprint would also change. Under Alternative 2, about 92 acres of the total footprint would be “intensively managed” landscape, with regular irrigation; 44 acres would be “minimally managed” landscape; and 20 acres would be “naturalized” landscape. These landscape management categories are defined and described in Chapter 2 of this EIR/EIS/EIS. The descriptions of these categories indicate that only the intensively managed areas would be irrigated regularly, and the irrigation network’s physical characteristics and operational system would be specifically redesigned to optimize water application to meet the management definitions throughout the reconfigured golf course. None of the naturalized areas would be irrigated after establishment; the minimally managed areas might be irrigated occasionally, but not regularly.

A working assumption for irrigation-water demand is that the minimally managed areas would consume approximately half as much water per unit area as the intensively managed areas, which are irrigated routinely to support high-quality turf features. Based on the proposed acreages and the likely water demand for each management category, the net effect of the 11-acre decrease in intensively managed landscape, 21-acre increase in minimally managed landscape, and 13-acre increase in naturalized landscape relative to existing conditions would be a total demand similar to existing demand. The current inefficient irrigation system is overwatering the minimally managed and naturalized landscapes; so at present, an area of up to 126 acres is being irrigated, 30 acres unintentionally. Under Alternative 2, the total area regularly irrigated would be reduced to 84 acres, and another 44 acres would be irrigated using the amount of water equivalent to 22 acres of intensively managed landscape, for a total of about 106 fully irrigated acres. This impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.3-1 (Alt. 3) **Long-Term Increase in Stormwater Runoff Volumes.** *Implementing Alternative 3 would reduce the golf course footprint, decrease the amount of impervious surface, and directly modify the existing channels of the creeks or the Upper Truckee River in the study area. Changes to stormwater drainage patterns may occur within the reconfigured golf course footprint and in the areas of existing golf course to be restored. Storm drainage systems within the reduced play golf course area would be upgraded locally to improve detention and infiltration of runoff. This effect would be* ***beneficial****.*

Alternative 3 would decrease the amount of impervious surface in SEZ adjacent to the Upper Truckee River and Angora Creek, to a greater extent than under Alternative 2. Additionally, Alternative 3 would not modify impervious surface coverage (soft coverage) within Washoe Meadows SP (See Impact 3.6-3 (Alt. 3) in Section 3.6, "Earth Resources")

Under Alternative 3, modified/retrofitted stormwater improvements and routing and detention basins would be incorporated as part of the landscaping within the reduced/reconfigured golf course footprint on the east side of the river (within Lake Valley SRA). No changes would be made to the subwatersheds having impervious surfaces or stormwater drainage facilities. No expansion or paving of the overflow parking would occur and no new restroom facility would be constructed. The production of stormwater runoff because of impervious surfaces would be decreased and occur within the existing stormwater drainage network that would be improved. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-2 (Alt. 3) **Long-Term Increase in Peak Flows Generated or Released Downstream.** *Implementing Alternative 3 would not increase peak flows generated within the study area from stormwater runoff. The proposed river channel modifications, enlargement of the active floodplain, and removal of all golf course bridge crossings under Alternative 3 would result in a beneficial reduction in peak flows released to downstream reaches of the Upper Truckee River during small to moderate flood events. Major flood-peak flows released downstream would not be expected to change. This effect would be* ***beneficial****.*

Alternative 3 would decrease the amount of impervious surface in the study area (as discussed under Impact 3.3-1 [Alt. 3]), which would not only decrease the volume of runoff generated but also lessen the generation of peak flows within the study area.

Under Alternative 3, modified/retrofitted stormwater improvements and routing and detention basins would be incorporated as part of the landscaping within the modified golf course footprint on the east side of the river. These improvements would improve the routing and detention of stormwater from the remaining developed areas and reduce the generation of peak flows within those areas.

The same enhancements and expansion of the active floodplain would occur under Alternative 3 as under Alternative 2. Implementing these enhancements may allow increased detention of overbanked waters and decrease downstream flood peaks, at least for small to moderate events. The reduction in peak flows released to downstream reaches of the Upper Truckee River during small to moderate flood events would be either the same as or slightly greater than that under Alternative 2.This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-3 (Alt. 3) **Long-Term Increase in Overbanking during Small to Moderate Flood Events.** *Implementing Alternative 3 would directly modify the size and configuration of the Upper Truckee River channel within the study area to increase the frequency of overbanking onto portions of the surrounding terrace, thus enlarging the active floodplain. Natural channel adjustments would increase the frequency of overbanking onto a small active floodplain, inset within the sections of existing incised channel that would be retained as part of the active channel. This effect would be* ***beneficial****.*

This impact is identical to Impact 3.3-3 (Alt. 2) for Alternative 2. The same changes would be made to the river channel and active floodplain under Alternative 3 as under Alternative 2. For a description of these changes and their effects, please refer to Impact 3.3-3 (Alt. 2). This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-4 (Alt. 3) **Long-Term Increase in the 100-Year Flood Hazard Area or Elevation.** *Implementing Alternative 3 would directly modify the size and configuration of the Upper Truckee River channel within the study area, which could allow the water surface elevation for the 100-year flood to increase or the boundary of the 100-year floodplain to expand. The expanded floodplain would be contained within open space areas and not include any residential areas. Nonetheless, because an increase in flood elevation and/or floodplain would occur, this impact would be* ***potentially significant****.*

This impact is identical to Impact 3.3-4 (Alt. 2) for Alternative 2. Alternative 3 would result in the same potential changes to the boundaries of the 100-year floodplain and flood water surface elevations. For a description of these changes and their effects, please refer to Impact 3.3-4 (Alt. 2). This impact would be potentially significant.

Mitigation Measure 3.3-4 (Alt. 3): Prevent Detrimental Increases in the Future Water Surface Elevation or Area of the 100-Year Flood.

This mitigation measure is identical to Mitigation Measure 3.3-4 (Alt. 2).

With the measure described above, design features would any increase in hazards or risk of damage. Therefore, with implementation of Mitigation Measure 3.3-4 (Alt. 3), Impact 3.3-4 (Alt. 3) would be less than significant.

IMPACT 3.3-5 (Alt. 3) **Long-Term Modification of Groundwater Levels and Flow Patterns.** *Implementing Alternative 3 would directly modify the size, shape, and location of existing creek and river channels; alter the size, elevation, or use of existing golf course ponds; change soils or subsurface conditions in the study area; and increase the potential for surface recharge within an enlarged active floodplain. In combination, these modifications would be expected to raise groundwater elevations along the river corridor and reduce seasonal variation in groundwater levels and gradients, and some artificial groundwater support would still occur in the location of golf course ponds. This effect would be* ***beneficial****.*

This impact is similar to Impact 3.3-3 (Alt. 3). The same changes to the river and floodplain would be made under Alternative 3 as under Alternative 2. Under this alternative, the golf course pond currently located by holes 14/15 would be backfilled and reshaped as part of floodplain restoration. The remaining golf course ponds would not be enlarged and no new ponds would be created west of the river. Only minor changes, if any, in groundwater levels or flow patterns east of the river would be expected because the retired pond by holes 14/15 would be within the reactivated floodplain area and near a reconnected meander that would provide improved surface-water support. All these activities would improve conditions relative to the existing conditions of an increased rate of groundwater loss to the incised river channel. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-6 (Alt. 3)	Long-Term Increase in Irrigation-Water Demand. *Implementing Alternative 3 would directly modify the locations and total acreage of specific irrigated land uses within the study area, and would reduce the size and upgrade the physical and operational irrigation system. It would reduce the golf course footprint, reduce intensively managed areas, increase naturalized areas, and improve the irrigation system. These changes would reduce total water demand in the study area to less than under existing conditions. This effect would be* ***beneficial****.*

As under Alternative 2, existing irrigated acreage and the irrigation system on the east side of the river would be modified under Alternative 3. However, the golf course would not be expanded to the west side of the river. The total footprint of the golf course would be reduced from 133 acres to 86 acres, and the vegetation types and their management within the footprint would also change. Under Alternative 3, about 51 acres of the total footprint would be "intensively managed" landscape, with regular irrigation; 24 acres would be "minimally managed" landscape; and 11 acres would be "naturalized" landscape. These landscape management categories are defined and described in Chapter 2 of this draft EIR/EIS/EIS. The descriptions of these categories indicate that only the intensively managed areas would be irrigated regularly, and the irrigation network's physical characteristics and operational system would be specifically redesigned to optimize water application to meet the management definitions throughout the reconfigured golf course. None of the naturalized areas would be irrigated after establishment; the minimally managed areas might be irrigated occasionally, but not regularly.

A working assumption for irrigation-water demand is that the minimally managed areas would consume approximately half as much water per unit area as the intensively managed areas, which are irrigated routinely to support high-quality turf features. Based on the proposed acreages and the likely water demand for each management category, the net effect of the 52-acre decrease in intensively managed landscape, 1-acre increase in minimally managed landscape, and 4-acre increase in naturalized landscape relative to existing conditions would be a total demand that would be less than existing demand. The current inefficient irrigation system is overwatering the minimally managed and naturalized landscapes; so at present, an area of up to 126 acres is being irrigated, 30 acres unintentionally. Under Alternative 3, the total area regularly irrigated would be reduce to 51 acres, and another 24 acres would be irrigated using the amount of water equivalent to 12 acres of intensively managed landscape, for a total of about 63 fully irrigated acres. This would reduce total demand by just over one-half relative to existing conditions and demand under Alternative 2. This effect would be beneficial.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.3-1 (Alt. 4)	Long-Term Increase in Stormwater Runoff Volumes. *Implementing Alternative 4 would not modify the existing golf course footprint, or directly modify the existing channels of the creeks in the study area. However, it would increase the amount of impervious surface for a new restroom and paved overflow parking area within Lake Valley SRA. The changes would occur within the same subwatersheds served by existing drainage systems, but at the conceptual level of design, it is uncertain whether site-specific features would be sized and located to prevent an increase in the amount of stormwater runoff released to the river or creeks in the study area. This impact would be* ***potentially significant****.*

Under Alternative 4, the areas and locations of existing impervious surfaces within the SEZ and floodplain adjacent to the Upper Truckee River and Angora Creek would not be modified (see Impact 3.6-3 (Alt. 4) in Section 3.6, "Earth Resources"). However, two existing bridges would be replaced by a single new bridge with associated cart path relocation, a new restroom would be constructed, and the existing overflow parking would be paved. The modifications to impervious surfaces would occur within the same sub-watersheds that have existing stormwater drainage features, facilitating incorporation of any additional stormwater detention or pre-treatment. However, the layout, specific features, and performance standards for the stormwater system have not yet been determined. In general, the sizing, location, and design of features would be expected to meet regulatory standards enforced by the Lahontan RWQCB and TRPA. Because it is uncertain whether storm drainage system features would be sized and located appropriately to prevent an increase in the amount of stormwater runoff released to the river or creeks in the study area, this impact would be potentially significant.

Mitigation Measure 3.3-1 (Alt. 4): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Damage from Increased Runoff Discharged to Creek or River Channels.

This mitigation measure is identical to Mitigation Measure 3.3-1 (Alt. 2).

With the measure described above, the stormwater system would be expanded and improved to meet specific performance requirements. Therefore, with implementation of Mitigation Measure 3.3-1 (Alt. 4), Impact 3.3-1 (Alt. 4) would be less than significant.

IMPACT 3.3-2 (Alt. 4)	**Long-Term Increase in Peak Flows Generated or Released Downstream.** *Implementing Alternative 4 would not modify the peak flows generated within the study area or measurably change flows released from the study area to downstream reaches of the Upper Truckee River. Stabilizing the Upper Truckee River streambed and streambanks throughout the study area would prevent continued natural adjustments to past disturbances. Therefore, the conveyance of peak flows through the study area or discharge of flows to downstream reaches would not change relative to existing conditions. This impact would be* ***less than significant****.*

Under Alternative 4, stormwater runoff volume would not increase (Impact 3.3-1 [Alt. 4]), and no physical modifications would be made to the study area soils, vegetation, or stream channels that would otherwise alter generation of peak flows throughout the study area.

No substantial changes to the size of creeks and river channels in the study area would be made under Alternative 4, but the incised Upper Truckee River channel would be stabilized in place. This stabilization to prevent streambank and streambed erosion would restrict natural geomorphic trends of channel widening and subsequent formation of an inset floodplain. The materials used to stabilize the channel may slightly decrease roughness on the streambed but increase the roughness of the streambanks. Minor changes in flow velocity and local hydraulics could occur within the treated reaches, but a measurable increase or decrease in peak flows released downstream would be difficult to discern. Stabilizing the channel in place would limit long-term opportunities for overbank floodplain storage during small to moderate (1.5-year to 10-year) flood events that could occur under Alternative 1, so a small long-term benefit might not be realized under Alternative 4. Additionally, the surrounding terrace would not be reactivated as an enlarged active floodplain to facilitate the substantial reductions in peak flows released downstream expected under Alternatives 2, 3, and 5. Little change in overbank floodplain storage during major (i.e., 25-year, 100-year) peak-flow events would be expected under Alternative 4. No adverse increase in peak flows generated within the study area or discharged to downstream reaches of the Upper Truckee River would result from implementing Alternative 4, but no beneficial peak-flow reductions would be achieved. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-3 (Alt. 4)	**Long-Term Increase in Overbanking during Small to Moderate Flood Events.** *Implementing Alternative 4 would not modify the size or configuration of the Upper Truckee River channel or floodplain within the study area. Stabilizing the streambed and streambanks would restrict natural channel adjustments to prior disturbances, limiting continued channel widening and formation of an inset floodplain. This impact would be* ***less than significant****.*

The size and configuration of study area stream channels and floodplain would not be physically modified under Alternative 4. Stabilizing the channel to prevent streambank and streambed erosion would restrict natural geomorphic trends of channel widening and subsequent formation of an inset floodplain. This would prevent the minor increase in opportunities for overbanking during small to moderate (1.5-year to 10-year) flood events expected under Alternative 1, and instead would retain the existing condition. The incised channel would remain isolated between high terrace banks. The area and location of the active floodplain would remain similar to the existing conditions (Exhibit 3.3-14). No beneficial increase in the frequency of overbanking or expansion of floodplain area on the surrounding terrace would occur as under Alternatives 2, 3, and 5. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-4 (Alt. 4)	**Long-Term Increase in the 100-Year Flood Hazard Area or Elevation.** *Implementing Alternative 4 would not modify the existing channel's size, shape, or location within the FEMA regulatory floodway, but would replace two undersized bridges at holes 6 and 7 with an increased-capacity bridge crossing over an excavated inset floodplain. The hydraulic effects of the bridge changes would be localized within portions of the study area and the effects, if measurable, would reduce water surface elevations and/or the floodplain boundary relative to existing conditions. This impact would be* ***less than significant****.*

Implementing Alternative 4 would not substantially raise the streambed elevation or water surface elevations within the treated river reaches (RS 1400 to RS 8800). Placement of rock and biotechnical treatments would be expected to result in minor hydraulic changes in roughness, but not enough to reduce conveyance of 100-year flows relative to existing conditions.

Under Alternative 4, the two existing golf course bridges upstream of holes 6 and 7 (approximately RS 8200 and RS 7575) would be replaced with a single, longer-span bridge between RS 7800 and RS 8100 (subreach 3B). The new bridge would span the entire channel and active floodplain, and piers would not be placed in the channel bed; therefore, flow constrictions created by the existing two bridges would be eliminated. In addition, an inset floodplain would be excavated near the new bridge to improve hydraulics under high flows, including the 100-year event. The improved conveyance in this subreach might have the localized effect of reducing water surface elevations or extent, but the three remaining golf course bridges downstream would continue to constrict flows. Additionally, the U.S. 50 bridge crossing would be unchanged and would continue to control the rate of flow released and water surface elevations at the downstream end of the study area. Minor localized reductions of 100-year water surface elevations near the replacement golf course bridge would not be expected to result in any adverse increases in either the boundary of the regulatory floodplain or flooding hazards. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-5 (Alt. 4)	**Long-Term Modification of Groundwater Levels and Flow Patterns.** *Implementing Alternative 4 would not modify the size, shape, or location of existing creek and river channels; alter the size, elevation, or use of existing golf course ponds; or change soils or subsurface conditions throughout the study area. Alternative 4 would not include any element that could adversely affect groundwater levels or flow patterns, but implementing this alternative would prevent the changes that might occur as the degraded channel continues to adjust via widening. This impact would be* ***less than significant****.*

Alternative 4 would perpetuate the existing degraded groundwater levels and patterns, including both natural conditions and artificial groundwater support from golf course ponds. However, stabilizing the channel to prevent streambed and streambank erosion would prevent the potential worsening of groundwater conditions that may result from continued widening of the natural channel, and retreat of groundwater along the incised river channel. These changes, which would occur under Alternative 1, could increase discharge (loss) to the river and therefore from the ponds. The effects of Alternative 4 on groundwater levels and flow patterns would be generally similar to effects under existing conditions, with minor benefits relative to Alternative 1. This impact would be less than significant.

No mitigation is required.

IMPACT 3.3-6 (Alt. 4) **Long-Term Increase in Irrigation-Water Demand.** *Implementing Alternative 4 would not directly modify the existing demand for irrigation water by land uses within the study area, nor would it modify the use of surface water from the Upper Truckee River or from on-site groundwater wells. Demand for irrigation water in the study area would remain similar to existing demand. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.3-6 (Alt. 1). Demand for irrigation water in the study area under Alternative 4 would be the same as under existing conditions and Alternative 1. For a description of effects on demand for irrigation water by land uses within the study area, please refer to Impact 3.3-6 (Alt. 1).

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.3-1 (Alt. 5) **Long-Term Increase in Stormwater Runoff Volumes.** *Implementing Alternative 5 would eliminate the golf course footprint, decrease the amount of impervious surface, and directly modify the existing channels of the creeks, drainages, and the Upper Truckee River in the study area. Changes to stormwater drainage patterns may occur within areas of existing golf course to be restored. Storm drainage systems within the clubhouse, parking lot, and maintenance area would be preserved for detention and infiltration of runoff. This effect would be* ***beneficial****.*

Alternative 5 would make a substantial decrease the amount of impervious surface within the SEZ and floodplain, to a greater extent than either Alternatives 2 or 3 and would include coverage removal along the unnamed creek. Additionally, Alternative 5 would not modify impervious surface coverage within Washoe Meadows SP (See Impact 3.6-3 (Alt. 5) in Section 3.6, “Earth Resources”).

The changes that would occur under Alternative 5 would create a benefit relative to existing conditions and all other action alternatives by replacing modified hydrology and storm drainage features with a more natural hydrologic response throughout the decommissioned golf course area that will have soils and vegetation restoration. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-2 (Alt. 5) **Long-Term Changes in Peak Flows Generated or Released Downstream.** *Implementing Alternative 5 would not increase peak flows generated within the study area from stormwater runoff. The proposed river channel modifications, enlargement of the active floodplain, and removal of all golf course bridge crossings would result in a beneficial reduction in peak flows released to downstream reaches of the Upper Truckee River during small to moderate flood events. No change to major flood peak flows released downstream would be expected. This effect would be* ***beneficial****.*

As discussed under Impact 3.3-1 (Alt. 5), implementing Alternative 5 would decrease the amount of impervious surface in the study area, which would not only decrease the volume of runoff generated but also lessen the generation of peak flows within the study area.

Under Alternative 5, stormwater improvements and routing and detention basins would be removed from the landscaping within the existing golf course use, and more natural soil, vegetation, and topographic drainage characteristics would be restored in the decommissioned golf course areas.

The same enhancements and expansion of the active floodplain would occur under Alternative 5 as under Alternatives 2 and 3. Implementing these enhancements may allow increased detention of overbanked waters and decrease downstream flood peaks, at least for small to moderate events. The reduction in peak flows released to downstream reaches of the Upper Truckee River during small to moderate flood events would either be the same as or slightly greater than that under Alternatives 2 and 3. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-3 (Alt. 5)	Long-Term Increase in Overbanking during Small to Moderate Flood Events. *Implementing Alternative 5 would directly modify the size and configuration of the Upper Truckee River channel within the study area to increase the frequency of overbanking onto portions of the surrounding terrace, thus enlarging the active floodplain. Natural channel adjustments would increase the frequency of overbanking onto a small active floodplain, inset within the sections of existing incised channel that would be retained as part of the active channel. This effect would be* ***beneficial****.*

This impact is identical to Impact 3.3-3 (Alt. 2). Alternative 5 would have the same increased overbanking during small to moderate flood events as Alternatives 2 and 3. For a full description of this effect, please refer to Impact 3.3-3 (Alt. 2). This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-4 (Alt. 5)	Long-Term Increase in the 100-Year Flood Hazard Area or Elevation. *Implementing Alternative 5 would directly modify the size and configuration of the Upper Truckee River channel within the study area, which could allow the water surface elevation for the 100-year flood to increase or the boundary of the 100-year floodplain to expand. The expanded floodplain would be contained within open space areas and not include any residential areas. Nonetheless, because an increase in flood elevation and/or floodplain would occur, this impact would be* ***potentially significant****.*

This impact is identical to Impact 3.3-4 (Alt. 2). Alternative 5 would result in the same potential changes to the boundaries of the 100-year floodplain and flood water-surface elevations as under Alternatives 2 and 3. For a full description of this effect, please refer to Impact 3.3-4 (Alt. 2). This impact would be potentially significant.

Mitigation Measure 3.3-4 (Alt. 5): Prevent Detrimental Increases in the Future Water Surface Elevation or Area of the 100-Year Flood.

This mitigation measure is identical to Mitigation Measure 3.3-4 (Alt. 2).

With the measure described above, design features would prevent any increase in hazards or risk of damage. Therefore, with implementation of Mitigation Measure 3.3-4 (Alt. 5), Impact 3.3-4 (Alt. 5) would be less than significant.

IMPACT 3.3-5 (Alt. 5)	Long-Term Modification of Groundwater Levels and Flow Patterns. *Implementing Alternative 5 would directly modify the size, shape, and location of existing creek and river channels; alter the size, elevation, or use of existing golf course ponds; change soils or subsurface conditions in the study area; and increase the potential for surface recharge within an enlarged active floodplain. In combination, these modifications would be expected to raise groundwater elevations along the river corridor and reduce seasonal variation in groundwater levels and gradients, and some artificial groundwater support would still occur in the location of golf course ponds. These effects would be beneficial relative to the existing degraded conditions. This effect would be* ***beneficial****.*

Alternative 5 would result in the same changes to groundwater conditions along the river corridor as under Alternatives 2 and 3, but decommissioning of the golf course might eliminate the surface pond features and their management as water storage facilities in the east half of the study area. The beneficial effects of Alternatives 2 and 3 on groundwater from restoring the river and meadow ecosystem, including overbanking for recharge, would also occur under Alternative 5. However, it is possible that some of the artificial support of groundwater by the golf course ponds would be discontinued. Under Alternative 5, the golf course pond currently located by holes 14/15 would be backfilled and reshaped as part of floodplain restoration. The eventual land uses under Alternative 5 would likely modify the physical characteristics and/or management of the remaining ponds, because the type or magnitude of water demand for such land uses is unlikely to be as great as for a golf course. The remaining ponds would still capture local snowmelt and storm runoff, providing detention and extending the groundwater recharge season. However, without the continued use of surface water diversions and deep groundwater pumping to supplement the pond water, some of the present recharge volume and summer-season groundwater recharge would be eliminated. This suggests that a portion of the total benefits expected under Alternatives 2 and 3 would not occur under Alternative 5, but would be confined more narrowly along the river corridor because the golf course ponds would no longer be needed or maintained.

The effects of Alternative 5 on groundwater would be beneficial relative to existing conditions, Alternative 1, and Alternative 4, and similar to but slightly less than the effects under Alternatives 2 and 3. This effect would be beneficial.

No mitigation is required.

IMPACT 3.3-6 (Alt. 5)	Long-Term Increase in Irrigation-Water Demand. *Implementing Alternative 5 may nearly eliminate irrigated land uses within the study area. Most of the physical and operational irrigation system would be abandoned after any temporary reduced golf course operations cease. Demand for irrigation water in the study area under Alternative 5 would be substantially less than that under existing conditions or any of the other action alternatives. This effect would be* ***beneficial****.*

Existing irrigated acreage and the irrigation system would be substantially modified under Alternative 5. The golf course use would be eliminated, and the vegetation types and their management within the existing footprint would be converted back to natural vegetation with the exception of about two acres of lawn. None of the 130 acres of decommissioned golf course restored to natural vegetation communities would be irrigated after initial establishment.

The current inefficient irrigation system is overwatering the minimally managed and naturalized landscapes; so at present, an area of up to 126 acres is being irrigated, 30 acres unintentionally. There would be no intensively managed landscape with regular irrigation under Alternative 5. Based on the proposed acreages and the likely water demand for each management category, the decrease in intensively managed landscape and restoration of natural plant communities supported by the restored river and floodplain hydrology would reduce total demand for irrigation water to less than five percent of that under existing conditions. This effect would be beneficial.

No mitigation is required.

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3.4 GEOMORPHOLOGY AND WATER QUALITY

This section presents the regulatory setting for geomorphology and water quality, describes the existing conditions in the study area related to geomorphology and water quality, and evaluates potentially adverse environmental impacts related to erosion, sedimentation, and deposition associated with project implementation.

The examination of geomorphology and water quality is based on information obtained through review of academic research and available information published by Federal, State, and local agencies, primarily the Final Report: Upper Truckee River Upper Reach Environmental Assessment (SH&G 2004a), the Amendment Report: Upper Truckee River Upper Reach Reclamation Project (SH&G 2004b), and the Riparian Ecosystem Restoration Feasibility Report associated with the Upper Truckee River Restoration Project (River Run Consulting 2006). The examination of geomorphology is also based on the preliminary engineering schematic designs prepared for the alternatives.

For a discussion of other water resource issues, refer to Section 3.3, "Hydrology and Flooding." Consistency with TRPA goals and policies is presented in Section 3.2, "Land Use," Table 3.2-1. Cumulative geomorphology and water quality impacts are addressed in Section 3.16, "Cumulative Impacts." The project's effects on thresholds are described in Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.4.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

Clean Water Act

The Clean Water Act (CWA) (33 United States Code [USC] 1251 et seq.) provides the primary basis for Federal regulations affecting geomorphology and water quality. CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate discharges of pollutants into waters of the United States. A NPDES permit sets specific discharge limits for point sources discharging pollutants into waters of the United States and establishes monitoring and reporting requirements, as well as special conditions. Discharges of stormwater to surface waters associated with construction activity including clearing, grading, and excavation activities mush also obtain an NPDES permit and implement measures to reduce or eliminate stormwater pollution. The Federal government delegates water pollution control authority under Section 402 of the CWA to the states and the states oversee compliance.

Under Section 303(d) of the CWA, water quality limited segments are identified, and Total Maximum Daily Loads (TMDLs) of pollutants to a water body listed as impaired pursuant to that section is required. Lake Tahoe is listed as impaired and the TMDL is being developed by California and Nevada to address pollutant loadings from all sources to achieve existing water quality objectives for deep water clarity and transparency (namely loadings of nitrogen, phosphorous, and fine sediment) (California Water Boards and NDEP 2009).

Section 404 of the CWA requires projects to receive authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), to discharge dredged or fill material into waters of the United States, including wetlands, whether the discharge is temporary or permanent. USACE Regional General Permit 16 authorizes activities with minimal individual and cumulative impacts on waters of the United States, including wetlands, in the Tahoe Basin (USACE 2005). This regional General Permit will expire September 30, 2010, but it is expected that the USACE will either extend the expiration date and/or issue a replacement permit effective as of that date. In conjunction with USACE's CWA Section 404 permits, CWA Section 401 requires that water quality certifications or waivers be issued by the U.S. Environmental Protection Agency (EPA), the states, or both (see below).

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (42 USC 300f et seq.) was established to protect the quality of drinking water in the United States. This law focuses on all waters actually or potentially designated for drinking use, whether from aboveground or underground sources. The SDWA authorized EPA to establish water quality standards and required all owners or operators of public water systems to comply with primary (health-related) standards. State governments, which assume this power from EPA, also encourage attainment of secondary (nuisance-related) standards. Contaminants of concern in a domestic water supply are those that either pose a health threat or in some way alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA as primary and secondary maximum contaminant levels (MCLs). As directed by the SDWA amendments of 1986, EPA has been expanding its list of primary MCLs. MCLs have been proposed or established for approximately 100 contaminants.

State

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) requires establishment of water quality objectives and standards to protect water quality for beneficial uses. This act is implemented by the State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs), which are responsible for preserving California's water quality. The SWRCB protects water quality by setting Statewide policy, coordinating and supporting RWQCB efforts, and reviewing petitions that contest RWQCB actions. The RWQCBs issue waste discharge permits, take enforcement action against violators, and monitor water quality for the protection of waters in their specified regions. The SWRCB and the RWQCBs jointly administer Federal and State laws related to water quality in coordination with EPA and USACE.

The study area is under the jurisdiction of the Lahontan RWQCB. The Lahontan RWQCB administers CWA Section 401 water quality certifications in conjunction with USACE's CWA Section 404 permit. In addition, the Lahontan RWQCB regulates discharge of stormwater from construction projects (as well as municipal and industrial stormwater) under the CWA Section 402 NPDES permit program. Because the project would disturb more than 1 acre of land, State Parks would need to obtain and comply with the Lahontan RWQCB's NPDES General Permit Number CAG616002 for discharge of stormwater runoff associated with construction activity. The SWRCB adopted a new statewide NPDES Construction General Permit Order 2009-0009-DWQ on September 2, 2009 that becomes effective July 1, 2010 (SWRCB 2010). This General Permit imposes more minimum BMPs and establishes three levels of risk-based requirements based on both sediment risk and receiving water risk. All dischargers are subject to narrative effluent limitations. Risk level 2 dischargers are subjet to technology-based numeric action levels (NALs) for pH and turbidity. Risk level 3 dischargers are subject to NALs and numeric effluent limitations (NELs). Certain sites must develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and Rain Event Action Plan (REAP) and all projects must perform effluent monitoring and reporting, along with receiving water monitoring and reporting for some Risk level 3 sites Key personnel (e.g., SWPPP preparers, inspectors, etc.) must have certifications to ensure their qualifications to design and evaluate project specifications that will meet the requirements. For projects commencing on or after July 1, 2010, the applicant must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities including the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the SWPPP, a signed certification statement by the Legally Responsible Person (LRP), and the first annual fee. The Lahontan RWQCB is responsible for enforcing the new statewide General Permit in its region and is updating its regional General Permit for construction stormwater discharges within the Lake Tahoe hydrologic unit to be as least as stringent as the statewide permit (Amorfini, pers. comm., 2010).

The Water Quality Control Plan for the Lahontan Region (Basin Plan), adopted March 31, 1995, and as amended, identifies the beneficial uses, water quality objectives, numerical standards, and waste discharge prohibitions for surface water and groundwater in the California portion of the Tahoe Basin (Lahontan RWQCB 1995:1-1). Table 3.4-1 summarizes the applicable environmental issues related to this project that are covered under the Basin Plan. Best management practices (BMPs) are defined as "[m]ethods, measures or practices selected by an

Table 3.4-1
Summary of Basin Plan Water Quality Control Measures Relevant to the Project

Water Quality Control Measure	Description
Water quality standards	State standards, including designated beneficial uses and water quality objectives, implemented by the SWRCB and RWQCBs. Regional "environmental threshold" standards implemented by TRPA.
Waste discharge prohibitions	State prohibitions against discharge of sewage, industrial waste, solid wastes, earthen materials, and so on, including prohibitions related to new subdivisions, land capability, SEZs, development not offset by remedial measures, and new piers in significant fish spawning habitat, implemented by the Lahontan RWQCB. TRPA implements similar land-use restrictions.
Best management practices	Use of BMPs mandatory for all new development. Implementation through State and TRPA permits and enforcement programs. Retrofit of BMPs required by the Lahontan RWQCB for existing development. BMPs also required for resource management uses, such as timber harvest and livestock grazing. The Basin Plan endorses the TRPA *BMP Handbook*.
Controls for SEZs and similar resources	Development and disturbance strictly limited in SEZs and setback areas, 100-year floodplains, and shorezone areas. Limited implementation through Lahontan RWQCB discharge prohibitions, TRPA land-use restrictions, and CWA Section 401 and 404 programs. Some exceptions for public projects and coverage relocation; specific exemption findings required. Restoration requirement of 1.5:1 for permitted SEZ disturbance, unless meets specific criteria, such as if the relocation is from one portion of a SEZ to another portion, there is a net environmental benefit to the SEZ. Shorezone projects must meet TRPA development standards. TRPA 208 Plan includes SEZ restoration program, which is expected to restore 25% of disturbed/developed SEZs. Control measures for other problems also serve to protect groundwater.
Water rights and water use	Limits on diversions for consumptive use from all sources in Tahoe Basin by act of Congress. Waste discharge requirements for sewer districts include conditions to prevent use beyond limits. TRPA plans include minimum fireflow requirements, as well as requirements for use of native/adapted plants in landscaping. Recommendations or SWRCB action on water rights policy update and water meter use.
Outdoor recreation	Controls for water quality impacts of outdoor recreation (dispersed recreation, campgrounds and day-use areas, ski areas, golf courses, and boating and shorezone recreation) through Lahontan RWQCB and TRPA permits and USFS programs on national forest lands. Impacts related to erosion, SEZ disturbance, fertilizer use, dredging and underwater construction, wastewater disposal, fuel spills, and so on.
Miscellaneous water quality problems	Control measures for problems related to fertilizer use, pesticide use, and wet and dry atmospheric deposition. Fertilizer and pesticide controls through Lahontan RWQCB and TRPA permits; atmospheric deposition control through TRPA traffic/air pollution controls and other 208 Plan commitments.

Notes:
208 Plan = regional water quality control plan required under Section 208 of the Clean Water Act
Basin Plan = *Water Quality Control Plan for the Lahontan Region*
BMP = best management practice
CWA = Clean Water Act
Lahontan RWQCB = Lahontan Regional Water Quality Control Board
SEZ = Stream Environment Zone
SWRCB = State Water Resources Control Board
TRPA = Tahoe Regional Planning Agency
USFS = U.S. Forest Service
Source: Lahontan RWQCB 1995:5-11 to 5-13

agency to meet its non-point source control needs. BMPs include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters" (Lahontan RWQCB 1995:5.3-1). Stream Environment Zones (SEZ) are wetland and riparian areas designated by the Tahoe Regional Planning Agency (TRPA) and the Lahontan RWQCB through specific criteria using designated water, soil, and vegetation indicators (Lahontan RWQCB 1995:5.7-2). The Basin Plan incorporates water quality thresholds, programs, and regulations as developed and implemented by TRPA along with Federal and State regulations. The project would be required to meet the provisions of the Basin Plan for the protection and enhancement of Lake Tahoe.

The Basin Plan lists water quality objectives for all surface waters of the region, including the Lake Tahoe Hydrologic Unit (HU), in addition to specific water quality objectives for certain water bodies in the Lake Tahoe HU (i.e., the entire watershed tributary to and containing Lake Tahoe), including the Upper Truckee River. The region-wide and water body-specific objectives pertaining to the Upper Truckee River, groundwater, and stormwater are summarized in Table 3.4-2). To achieve those objectives, the Basin Plan prohibits discharges and threatened discharges in 100-year floodplains. These prohibitions are described in Chapter 5 of the Basin Plan and those relevant to project implementation are summarized below in Table 3.4-3.

Tahoe Regional Planning Agency

1987 Regional Plan

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the Regional Plan for the Lake Tahoe Basin (Regional Plan). TRPA's Regional Plan, adopted in 1987, consists of several documents: Goals and Policies, Code of Ordinances, Water Quality Management Plan, Plan Area Statements (PAS), and Scenic Quality Improvement Plan.

The 1987 Regional Plan, which had a 20-year scope, is being reviewed and updated through a collaborative effort, called Pathway, among TRPA, USFS, the Lahontan RWQCB, and Nevada Department of Environmental Protection (NDEP) (TRPA 2007a). These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The updated Regional Plan is expected to be adopted in 2010.

Regional Plan Goals and Policies

The Regional Plan's Goals and Policies document presents specific goals and policies for achieving and maintaining adopted environmental thresholds. These goals and policies are implemented through the TRPA Code of Ordinances (TRPA Code) (TRPA 1986:I-1), described below. A key component of the Goals and Policies document is the Land Use Element, which identifies the fundamental philosophies directing land use and development in the Tahoe Basin. The Land Use Element consists of seven sub elements, including the Water Quality Sub Element. This sub element identifies two goals and 18 policies designed to support attainment of the water quality thresholds:

GOAL 1: Reduce loads of sediment and algal nutrients to Lake Tahoe; meet sediment and nutrient objectives for tributary streams, surface runoff, and subsurface runoff, and restore 80 percent of the disturbed lands.

- **Policy 1:** Discharge of municipal or industrial wastewater to Lake Tahoe, its tributaries, or the groundwaters of the Tahoe Region is prohibited, except for existing development operating under approved alternative plans for wastewater disposal, and catastrophic wildfire protection to prevent the imminent destruction of the STPUD [South Tahoe Public Utility District] Luther Pass Pump Station.

Table 3.4-2 Water Quality Objectives for the Upper Truckee River		
Water Quality Constituent	Lahontan Region Water Quality Objective	
	Numeric Standard (mg/L unless noted) [1]	Narrative Limits or Explanation of Numeric Tests
Upper Truckee River		
Ammonia	calculation	pH and temperature dependent values
Bacteria, Coliform	20/100 ml 40/100 ml	Log mean during any 30-day period Limited to no more than 10% of samples in any 30-day period.
Biostimulatory Substances	-	Concentrations must not promote aquatic growth to the extent of nuisance or adversely affect beneficial uses
Chemical Constituents	-	All MCLs and SMCLs of the CCR, for each designated beneficial use.
Chloride	4	
Chlorine (Total Residual)	0.003/0.002	Max/Median based on daily measurements in any 6 month period.
Color		Water shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen (DO)	80% of saturation	Not to be depressed by more than 10%, nor shall the minimum DO saturation concentration be less than 80%; Specific limits apply to aquatic resource beneficial uses.
Floating Materials		Shall not cause nuisance or adversely affect beneficial uses.
Iron, Total	0.03	
Nitrogen, Total	0.19	
Nondegradation of Aquatic Communities and Populations		Wetlands shall be free of substances attributable to wastewater or other discharges that produce adverse response in organisms.
Oil and Grease		Shall not result in a visible film or coating on the surface of the water or on objects in the water that cause nuisance, or adversely affect beneficial uses.
Pesticides		Not to exceed lowest detectable levels.
pH	6.5-8.5	Not to be outside the stated limits: Waters designated as COLD beneficial use shall have less than 0.5 pH unit change.
Radioactivity		Shall not be present at concentrations deleterious to organisms, or result in accumulation of radionuclides.
Phosphorus, Total	0.015	
Settleable Materials		Shall not result in deposition of material that causes nuisance or adversely affects beneficial uses.
Sulfate	1	
Suspended Materials		Shall not cause nuisance or adversely affect beneficial uses.
Suspended Sediment	60	90th percentile value
Taste and Odor		Shall not impart undesirable tastes or odors to fish or other edible products, cause nuisance, or adversely affect beneficial uses.

Table 3.4-2 Water Quality Objectives for the Upper Truckee River		
	Lahontan Region Water Quality Objective	
Water Quality Constituent	Numeric Standard (mg/L unless noted) [1]	Narrative Limits or Explanation of Numeric Tests
Temperature		Natural receiving water temperatures shall not be altered
Total Dissolved Solids	55	
Toxicity		Remain free of substances in concentrations that are toxic or detrimental to organisms (based on indicator organisms).
Turbidity	<10% over natural NTU	Shall not cause nuisance or adversely affect beneficial uses.
Groundwater		
Fecal Coliform	1.1/100 MPN	mL/ 7-day period median in groundwater designated as MUN
Chemical Constituents		Incorporates MCLs and SMCLs of the CCR for beneficial uses.
Radioactivity		For municipal groundwater, incorporates standards of the CCR.
Taste and Odor		Shall not contain in concentrations that interfere with beneficial use. For municipal groundwater, incorporates standards of the CCR.
Stormwater Runoff		
Total Nitrogen as N	0.5; 5.0	For discharges to collection systems, Lake Tahoe or any of its tributaries; For discharges to land treatment systems.
Total Phosphorus as P	0.1; 1.0	For discharges to collection systems, Lake Tahoe or any of its tributaries; For discharges to land treatment systems.
Total Iron	0.5; 4.0	For discharges to collection systems, Lake Tahoe or any of its tributaries; For discharges to land treatment systems.
Turbidity	20 NTU; 200 NTU	For discharges to collection systems, Lake Tahoe or any of its tributaries; For discharges to land treatment systems.
Grease and Oil	2; 40	For discharges to collection systems, Lake Tahoe or any of its tributaries; For discharges to land treatment systems.

Notes:

MCL = Maximum Contaminant Level, SMCL = Secondary Maximum Contaminant Level; CCR=California Code of Regulations

* Where there is a direct and immediate connection between ground and surface waters, discharges to groundwater shall meet the guidelines for surface discharges.

Sources:

1 California Water Quality Control Board Lahontan Region (LRWQCB). 1995. Water Quality Control Plan for the Lahontan Region: North and South Basins. State of California. Chapter 5, Lake Tahoe Basin

Table 3.4-3 Discharge Prohibitions, Lake Tahoe Hydrologic Unit
General Prohibitions
Against discharges that violate water quality objectives or impair beneficial uses Against discharges that cause further degradation of water where objectives are already being violated Against discharges to surface waters of the Lake Tahoe Hydrologic Unit
Prohibitions Related to Development
Against discharges or threatened discharges below the high-water rim of Lake Tahoe or in the 100-year floodplains of tributaries Against discharges attributable to new development in Stream Environment Zones Against discharges attributable to new development not in accordance with offset requirements
Source: Lahontan RWQCB 1995:5.8-12

- **Policy 2:** All persons who own land and all public agencies which manage public lands in the Lake Tahoe Region shall put best management practices (BMPs) in place; maintain their BMPs; protect vegetation on their land from unnecessary damage; and restore the disturbed soils on their land.

- **Policy 3:** Application of BMPs to projects shall be required as a condition of approval for all projects.

- **Policy 4:** Restore at least 80 percent of the disturbed lands within the region.

- **Policy 5:** Units of local government, state transportation departments, and other implementing agencies shall restore 25 percent of the SEZ lands that have been disturbed, developed, or subdivided in accordance with the Capital Improvements Program (Part II).

- **Policy 6:** The use of fertilizer within the Tahoe region shall be restricted to uses, areas, and practices identified in *The Handbook of Best Management Practices*. Fertilizers not be used in or near stream and drainage channels, or in stream environment zones, including setbacks, and in shorezone areas. Fertilizer use for maintenance of preexisting landscaping shall be minimized in stream environment zones and adjusted or prohibited if found, through evaluation of continuing monitoring results, to be in violation of applicable water quality discharge and receiving water standards.

- **Policy 7:** Off road vehicle use is prohibited in the Lake Tahoe region except on specified roads, trails, or designated area where the impacts can be mitigated.

- **Policy 8:** Transportation and air quality measures aimed at reducing airborne emissions of oxides of nitrogen in the Tahoe basin shall be carried out.

GOAL 2: Reduce or eliminate the addition of other pollutants which affect, or potentially affect, water quality in the Tahoe Basin.

- **Policy 1:** All persons engaging in public snow disposal operations in the Tahoe region shall dispose of snow in accordance with site criteria and management standards in *The Handbook of Best Management Practices*.

- **Policy 2:** Discharges of sewage to Lake Tahoe, its tributaries, or the groundwaters of the Lake Tahoe region are prohibited. Sewage collection, conveyance and treatment districts shall have approved spill contingency, prevention, and detection plans.

- **Policy 3:** All institutional users of road salt in the Lake Tahoe region shall keep records showing the time, rate, and location of salt application. Storage of road salt shall be in accordance with *The Handbook of Best Management Practices*.

- **Policy 4:** Underground storage tanks for sewage, fuel, or other potentially harmful substances shall meet standards set forth in TRPA ordinances, and shall be installed, maintained, and monitored in accordance with *The Handbook of Best Management Practices*.

- **Policy 5:** No person shall discharge solid wastes in the Lake Tahoe region by depositing them on or in the land, except as provided by TRPA ordinance.

- **Policy 6:** TRPA shall cooperate with other agencies with jurisdiction in the Lake Tahoe region in the preparation, evaluation, and implementation of toxic and hazardous spill control plans.

- **Policy 7:** The BMPs will be amended to include special construction techniques, discharge standards, and development criteria applicable to projects in the shorezone.

- **Policy 8:** Liquid or solid wastes from recreational vehicles and boats shall be discharged at approved pump-out facilities. Pump-out facilities will be provided by public utility districts, marinas, campgrounds, and other relevant facilities in accordance with standards set forth in *The Handbook of Best Management Practices*.

- **Policy 9:** Evaluate the feasibility and effectiveness of ponding facilities along stream corridors as a strategy for removing instream loads of sediment and nutrients.

- **Policy 10:** Reduce the impacts of motorized watercraft on water quality.

Before the TRPA Code was established, TRPA prepared Volume 1 of the regional water quality management plan required under Section 208 of the CWA (208 Plan), along with other environmental values and standards, to identify important issues relating to water quality in the Tahoe Region (TRPA 1981:1-4). Subsequently, the Lahontan RWQCB incorporated appropriate provisions of the 208 Plan into the Basin Plan. The 208 Plan has the same two major water quality goals as the Regional Plan. The first goal, with eight policies to support its implementation, is to reduce loading of sediment and nutrients to Lake Tahoe and meet sediment and nutrient objectives for tributary streams, surface runoff, and subsurface runoff. The second goal, with 10 policies to support its implementation, is to reduce or eliminate the addition of other pollutants that affect water quality in the Tahoe Basin.

Code of Ordinances

The TRPA Code is a compilation of all the ordinances needed to implement the Goals and Policies. The following portions of the TRPA Code are most relevant to the geomorphology and water quality aspects of the project:

- Basic standards and prohibitions for all discharges to surface waters and groundwater are specified in TRPA Code Chapter 81, “Water Quality Control.” Table 3.4-4 describes the discharge limits to surface runoff and to groundwater discharges in the Tahoe Basin.

- Measures to avoid or reduce potential short-term and long-term erosion and sedimentation effects on the quality of surface water, groundwater, or both are required by TRPA Code Chapter 64, “Grading Standards”; Chapter 65, “Vegetation Protection during Construction”; and Chapter 77, “Revegetation.”

Table 3.4-4 TRPA Limits on Discharges for Water Quality Control	
Constituent	Maximum Concentration
Surface runoff: Pollutant concentration in surface runoff shall not exceed the following reading at the 90th percentile:	
Dissolved inorganic nitrogen as N	0.5 mg/L
Dissolved phosphorus as P	0.1 mg/L
Dissolved iron as Fe	0.5 mg/L
Grease and oil	2.0 mg/L
Suspended sediment	250 mg/L
Discharge to groundwaters: Waters infiltrated into soils shall not exceed the following maximum constituent levels:	
Total nitrogen as N	5 mg/L
Total phosphate as P	1 mg/L
Iron as Fe	4 mg/L
Turbidity	200 NTU
Grease and oil	40 mg/L
Notes: mg/L= milligrams per liter; NTU = nephelometric turbidity unit Source: TRPA 1980:81-1, 81-2	

- Measures to prevent contamination of sources of drinking water and protect the public health relating to drinking water are required by TRPA Code Chapter 83, “Source Water Protection.” This measure may apply to the project since a few domestic wells are located immediately north of the study area and the confluence of the Upper Truckee River and Angora Creek. The public well south of the study area close to U.S. Highway 50 (U.S. 50) in Meyers is believed to be located far enough from the study area to avoid any potential impact.

- A section of the TRPA Code in Chapter 20 Land Coverage Standards that indirectly relates to water quality, given the ability of SEZs to buffer waterways and provide infiltration and uptake opportunities, also relates to the project. Land coverage standards, limitations, and prohibitions of additional land coverage in TRPA Code Chapter 20 would apply.

Plan Area Statements

Each PAS outlines land use classifications, special policies, planning considerations, permissible uses, and maximum allowances for a portion of the Tahoe Basin. The study area is located in PAS 119 (Country Club Meadow), which is designated as an outdoor recreation and natural resource area with opportunities for SEZ restoration (TRPA 2005:1). PAS 119 planning considerations include a statement that the riverbanks are locally unstable and that log jams are contributing to streambank erosion. The following special policies are relevant to water quality and geomorphology for this particular PAS (TRPA 2005:2):

- Whenever possible, opportunities for restoration of disturbed SEZs and land coverage removal should be encouraged, including strategies to mitigate the impacts of the golf course.

- A stream channel maintenance program should be implemented to protect the value of the river as a fishery and to minimize the risks of bank erosion.

- Erosion control, runoff control, and SEZ restoration are all permissible uses under resource management of PAS 119.

Environmental Threshold Carrying Capacities

Environmental thresholds for the Tahoe Basin have been established for water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation. These thresholds indicate the capacity of the region to accommodate additional land development. Every 5 years, TRPA conducts a comprehensive evaluation that identifies whether each threshold is being achieved or maintained, provides specific recommendations to address problem areas, and directs general planning efforts for the next 5-year period. The most recent threshold evaluation was completed and adopted by the TRPA Governing Board in 2007 (TRPA 2007b). Recommended changes to thresholds are being evaluated for future implementation. Attainment status results from the 2006 evaluation are used in this document to describe the affected environment; however, thresholds adopted in 1987 remain in effect.

The following narrative and numeric standards for the adopted TRPA water quality thresholds directly relate to the project:

- WQ-4. Tributaries threshold to attain state standards for nitrogen, phosphorus, iron, and a 90th percentile value for suspended sediment of 60 milligrams per liter (mg/L).

- WQ-5. Stormwater runoff, surface water threshold to attain TRPA surface water discharge standards for nitrogen, phosphorus, iron, grease and oil and suspended sediment.

- WQ-6. Stormwater runoff, groundwater threshold to attain TRPA discharge standards for infiltration to groundwater for nitrogen, phosphorus, and iron; along with turbidity, grease and oil.

The three directly related water quality thresholds all have a “non attainment” status.

In addition, the adopted TRPA Soil Conservation SC-2 SEZ threshold applies indirectly to the geomorphology and water quality aspects of the project. The narrative and numeric standards of SC-2 are as follows:

- SC-2. Naturally Functioning SEZ Threshold. It has a “non attainment” status.

- Preservation of existing naturally functioning SEZ lands;

- Restoration of disturbed SEZ in undeveloped, unsubdivided lands; and,

- Restoration of 25 percent of the SEZ lands that have been identified as disturbed, developed, or subdivided to attain a 5 percent increase in the area of naturally functioning SEZ lands.

El Dorado County

The study area is located entirely in El Dorado County; therefore, the El Dorado County Grading Ordinance (Chapter 15.14) and the Tahoe Basin Special Conditions Section of the El Dorado County Grading Design Manual (El Dorado County 2007) are applicable, although State-owned land is not subject to local government ordinances. The project’s required compliance with USACE, Lahontan RWCQB, and TRPA requirements related to water quality protection also would address the goals and objectives of the El Dorado County General Plan (El Dorado County 2004:44) and Grading Ordinance previously mentioned.

ENVIRONMENTAL SETTING

This section describes both the water quality and the geomorphologic characteristics in the study area. The geomorphologic characteristics and related processes, including erosion and sedimentation, are described because they influence physical and biological aspects of the water quality conditions. Additionally, some aspects of water quality in the study area and in surrounding surface water and groundwater bodies are independent of geomorphic characteristics of the study area.

Geomorphology

River and Streams

The geomorphology of the study area has been influenced by both natural geologic, climatic, hydrologic and geomorphic processes as well as by human disturbance. The Upper Truckee River, Angora Creek, and the unnamed creek in the study area were altered by watershed-scale changes in land use, hydrology, and sediment loads, as well as on-site uses (e.g., Comstock-era log transport, early 1900s irrigation and grazing) over the last 100 years as well as changes during modern urban development. Channel response to those watershed and on-site effects, within the context of the underlying geologic controls, have resulted in a channel with degraded geomorphic conditions, higher erosion rates, less floodplain connectivity and decreased ecosystem function.

Upper Truckee River Alignment

The study area is located between the U.S. 50 crossings at Meyers and Elks Club Drive. Although the valley floor is wide in the project vicinity, the channel alignment is somewhat confined by glacial outwash terrace and delta deposits in the upstream portion of the study area and by the alluvial fan from the unnamed creek in the downstream portion of the study area (see Section 3.6, “Earth Resources: Geology, Soils, and Land Capabilities and Coverage,” and Exhibit 3.6-1).

Both moraines and outwash occur in the study area as a result of different climatic conditions. Multiple glacial episodes formed the glacial moraines and outwash terraces composed of large boulders and cobbles, sand and gravel deposits, and periods of higher lake elevations produced delta deposits upstream of and along the west side of the site, (SH&G 2004a:II-2) while inundating the downstream half of the study area. The modern river has reworked and selectively transported smaller sized materials in the outwash deposits, but it is not effective at eroding or transporting the larger boulders or cobbles. In the study area, the Upper Truckee River channel and active floodplain is approximately 60–200 feet wide and bounded by low floodplain terraces and high glacial outwash terraces and delta deposits (Walck pers. comm. 2009; SH&G 2004a: II-2).

The channel pattern in the project vicinity likely changed dramatically over glacial and interglacial cycles due to the combined effects of large variations in sediment supply and streamflows, along with differences attributable to rising and falling lake levels. The presence of exposed, unvegetated side slopes and valley floor deposits left during glacial retreats would have increased sediment loads and supported a braided channel pattern (i.e., multiple low-flow channels) (River Run Consulting 2006: 12). During periods of high lake stands, fine-grained deposits were laid down on the valley floor in the lower half of the study area and downstream (under the lake) while coarse outwash deltas were created along the lake margin, especially the upper half of the study area. Sediment supply decreased over the Holocene (approximately the last 10,000 years) as vegetation colonized the upper watershed hillslopes and outwash deposits following the glacial retreat. The channel began reworking and eroding down through the outwash. The meadow reaches underlain by fine-texture lake bed and stream deposits generally produced single-thread, meandering stream channel patterns. However, reaches underlain by coarse outwash deposits were steeper where confined by moraines and outwash and continued to have a braided channel form (River Run Consulting 2006:12). Braiding occurred in the locations of downstream transition from narrow and confined to wider valley flats.

The Comstock mining boom between 1860 and 1890 brought about substantial changes in the watershed. Loss of trees and compaction of soils from clear-cut logging and primitive log transport methods increased runoff, soil erosion, and sediment supply to the river. Intensive logging, including clear-cutting and hauling, took place in the area surrounding the Upper Truckee River below the U.S. 50 crossing at Meyers. Straightening the channel to help move the logs downriver and constructing splash dams likely also affected the Upper Truckee River. Splash dams were temporary structures to impound the flow and create a pond where logs could be stored. Once full, the dam would be breached, sending the logs downstream to Lake Tahoe (SH&G 2004a: II-21).

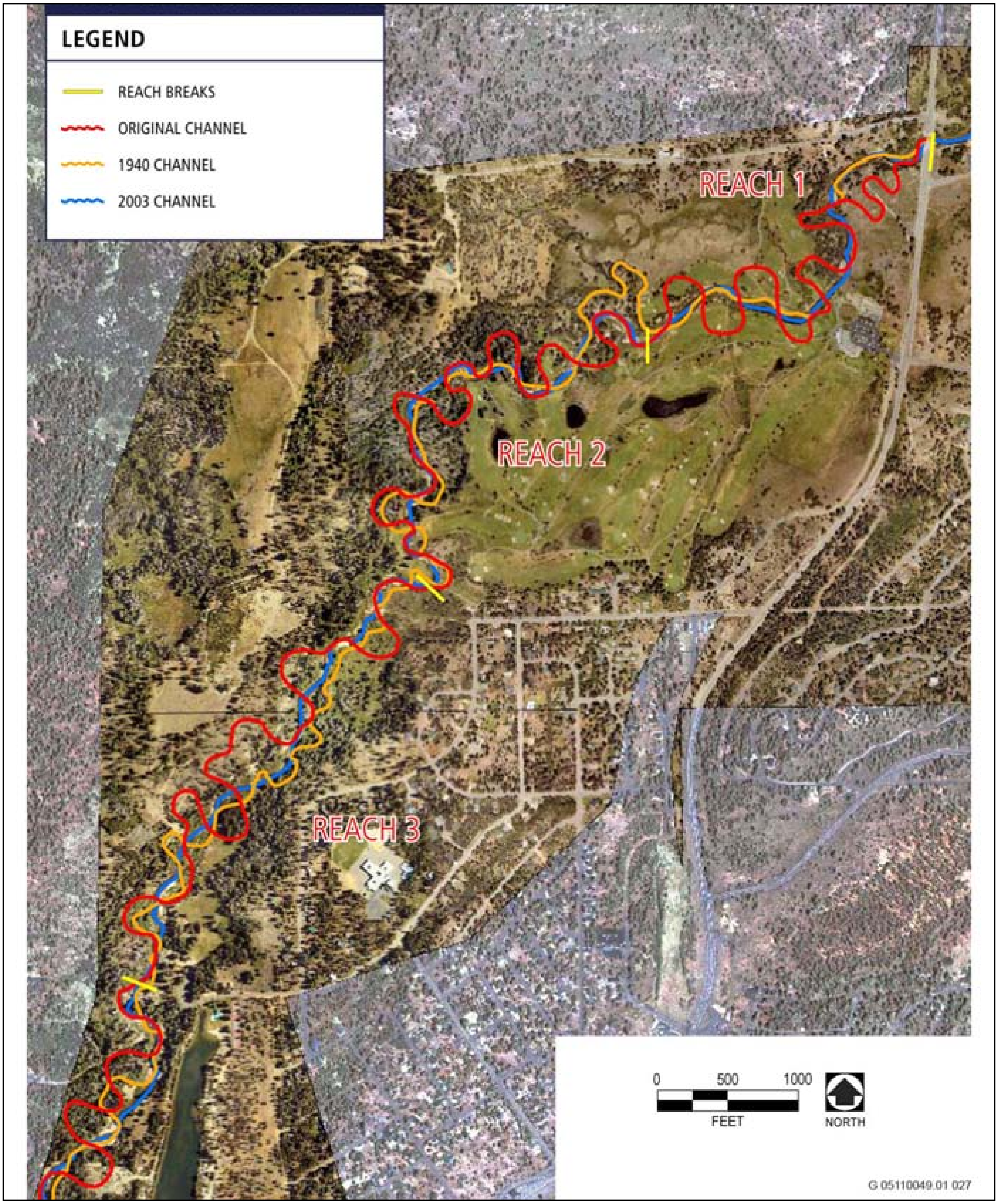
Road and railroad development through the Upper Truckee River watershed was initiated during the Comstock mining boom, and road additions, bridge replacements, and alignment changes continued through the late 1990s. Construction of bridge and road crossings often involved placing fill across floodplains and limiting the capacity for flow to pass under the bridges in the main channel. Such localized constrictions caused higher velocities and often resulted in channel incision for considerable distances upstream and downstream of the crossing (SH&G 2004a: II-19).

Upper watershed grazing during the post-logging era probably continued trends of relatively high sediment supply to the Upper Truckee River and Angora Creek (River Run Consulting 2006:18). Using floodplain meadows as pastureland in the early 1900s also had direct impacts on the stream channels, streamflows, and floodplain soil and vegetation. For example, as shown in the 1940 and 1952 aerial photographs of the area, a dairy stood in the current location of the Lake Tahoe Golf Course and Washoe Meadows State Park; the Angora Creek channel had been straightened and/or deepened to minimize flooding and allow for earlier seasonal grading, and a diversion works was present to provide late-season irrigation across the meadows (SH&G 2004a:II-19, II-21).

Historic channel patterns are often best seen on older aerial photographs. The earliest aerial photographs available for the study area were taken in 1940, well after initial human impacts, so the channel patterns do not fully represent natural function. The earliest available aerial photographs of the study area were taken in 1940, around 80 years after the beginning of the Comstock logging era, so the channel patterns in these photographs do not directly portray undisturbed conditions. Rather, they include the impacts of logging, grazing, roads, and bridges that had occurred before the photographs were taken. However, characteristics of meander cutoffs and other floodplain features visible on early historic photos provide clues to prior patterns and channel dynamics. Floodplain meander scars and other evidence along the Upper Truckee River in the study area suggest that channel patterns have changed over the past 150 years because of human disturbance of the watershed and the channel. Swanson Hydrology + Geomorphology (SH&G) developed an estimated pre-1940 channel pattern by tracing and connecting visible meander scars from the 1940 aerial image and 2003 LIDAR image and topographic map (SH&G 2004a:II-14). The estimated original channel should be considered an indication of the possible maximum channel length and sinuosity (i.e., ratio of channel length to valley length; the higher the sinuosity, the more river bends are present a given reach) that may have existed in the last couple of centuries (Exhibit 3.4-1). It is uncertain and somewhat unlikely that all of the relict meanders were active concurrently, but a trend of decreasing channel length and straightening over the historic era is evident, even if SH&G's estimated original channel is a maximum sinuosity version. The meander scars in the upstream portion of the study area have low amplitude and tend not to exhibit scrolling, which suggest episodic channel migration in the past. In the downstream end of the study area, high-amplitude meander scars east of the present channel suggest a highly sinuous channel pattern in the past (River Run Consulting 2006:17).

The modern phase of channel straightening and deepening began in the 1930s and 40s likely to protect dairy operations from flooding and continued in the mid-1950s to accommodate roadway construction (SH&G 2004a:III-151). This channel straightening reduced the channel length by 28 percent and lowered sinuosity from 1.54 in 1940 to 1.14 by 1994 (River Run Consulting 2006:20). The golf course was constructed on the former floodplain in the lower half of study area between 1958 and 1962. Rapid development from the early 1960s to the 1970s increased the supply of sediment in the watershed due to increased runoff and erosion, but aerial photo analysis of the channel pattern it did show any further dramatic changes.

The results of analysis of sediment cores under Lake Tahoe show major changes in sediment delivery to the lake during the historical series of watershed disturbances discussed above (Table 3.4-5). The sediment core analyses do indicate that rates of sediment delivery returned to background levels reasonably quickly following disturbances (River Run Consulting 2006:21). Although the sediment delivery to the lake changed dramatically, there is little evidence to suggest that the increase in sediment supply resulted in a large-scale aggradation (i.e., sediment deposition that raises the streambed) in the Upper Truckee River. (River Run Consulting 2006:21).



"Original Channel" as mapped is considered a maximum channel length estimate based on connected remnant channel segments, including those that might not have been part of a particular single channel.
Source: SH&G 2004a

Present (2003), Historical (1940), and Estimated Original Upper Truckee River Channel Alignments **Exhibit 3.4-1**

Table 3.4-5 **Historical Watershed Condition and Lake Sedimentation Rates**		
Time Period	Watershed Condition Land Use	Lake Core Mass Sedimentation Rate ($g/cm^2/year$)
Predisturbance (pre-1850)	Predisturbance	0.006 (± 0.003)
Comstock era (1860–1890)	Extensive logging and construction of logging roads; log runs down Upper Truckee River	0.043 (± 0.011)
1900–1970	Forest second growth; rapid urbanization in 1960s	0.009 (± 0.004)
Modern (1970–1990)	Continued forest regrowth and urbanization	0.027 (± 0.006)

Note: $g/cm^2/year$ = grams per square centimeter per year.
Source: Heyvaert 1998

Angora Creek Alignment

Angora Creek originates at Angora Lakes along the western side of the watershed. It flows through residential neighborhoods and large meadows before entering the Upper Truckee River at the downstream end of the golf course near River Station (RS) 1800. Only the most downstream 2,500 feet of Angora Creek is in the study area, sharing a floodplain with the river on its north side.

Angora Creek was altered by humans to enhance grazing and pasture use, particularly in the area just upstream of its confluence with the Upper Truckee River. Originally, Angora Creek entered the river just upstream of the U.S. 50 crossing at Elks Club Drive; however, sometime before 1940, it was relocated to enter the Upper Truckee River roughly 2,000 feet farther upstream to drain the meadow for improved pasture (River Run Consulting 2006:19). In addition, irrigation facilities visible in the 1940 aerial photograph were constructed, including a diversion headgate and small pond in the Angora Creek meadow and several ditches to facilitate grazing. In the 1960s, an upstream reach of Angora Creek moved to occupy an unvegetated scar along the recently installed sewer pipe, subsequently incising.

Between 1998 and 2002, State Parks implemented two projects that restored 8,000 linear feet of Angora Creek channel and floodplain, of which 2,500 feet were in the study area. The projects restored the channel to a sinuous planform reconnected to the meadow floodplain. Activities included: reconstructing the channel; reoccupying remnant channels where appropriate; and, moving the channel mouth slightly downstream of its original location to compensate for historic incision of the Upper Truckee River (SH&G 2004a:II-23).

Unnamed Tributary Alignment

A small unnamed creek enters the Upper Truckee River in the study area (see Exhibit 3.3-2). The unnamed creek's headwaters are in the Tahoe Paradise Golf Course in Meyers, and the creek flows northward along and under U.S. 50 and through the Meyers residential area via a channelized ditch (SH&G 2004a:II-2). The unnamed creek receives the bulk of its runoff from commercial and residential areas, including runoff directly from U.S. 50. This small tributary was also channelized before 1940 (River Run Consulting 2006:18). The upstream section in the Tahoe Paradise Golf Course was channelized, and much of the riparian vegetation has been removed (SH&G 2004a:III-56).

Downstream of U.S. 50, the unnamed creek was channelized to move it away from a historical wet meadow and allow for development of the commercial area along the highway. A later attempt to divert flow out of this channelized section and back into the meadow via a berm across the channel resulted in overtopping and formation of a large scour hole downstream that may have added to downcutting and channel widening in that reach (SH&G 2004a:III-56). The portion of the unnamed creek in the study area is a shallow swale likely straightened for grazing operations prior to golf course construction that now drains runoff from the managed turf grasses.

Upper Truckee River Profile

Historical channel incision has occurred throughout the Upper Truckee River, from the study area downstream to Lake Tahoe, and has altered the profile of the streambed. Evidence that the river channel has incised includes the enlarged channel relative to the streamflows; eroding knickpoints (i.e., headcuts) in the streambed; reduced overbank flow frequency; lack of bedforms, such as gravel bars and pools; and high streambanks with accelerated streambank erosion (River Run Consulting 2006:22).

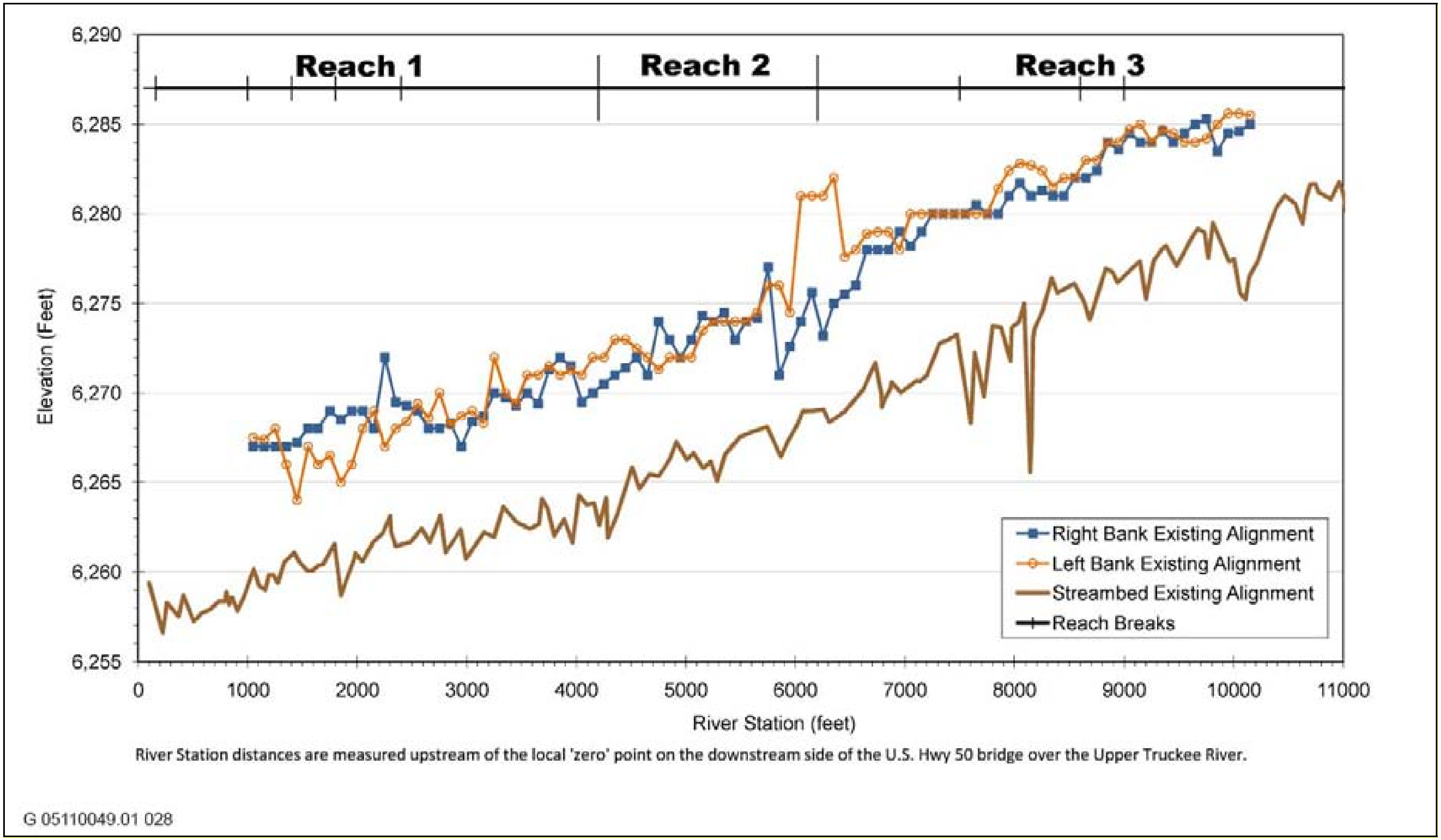
Incision by streambed erosion is a channel's response to various forces, and it modifies the channel's profile and slope. Straightening (channelization) reduces channel sinuosity and channel length, resulting in a steepened channel slope, increased streamflow velocity, and greater erosive forces (SH&G 2004a:II-19). Several experts have concluded that channel incision in the lower reaches of the Upper Truckee River has occurred in response to channelization (River Run Consulting 2006:22). Other local practices that likely contributed to channel incision include removal of woody debris to "clear" the channel, which reduced sediment storage and increased erosive power; splash damming and log transport operations, which increased channel depth and width; and logging and grazing, which decreased infiltration and increased runoff, floods, and erosive power. Grazing of meadows on the floodplains also would have reduced riparian vegetation cover and modified soils along the channel, making the channel banks more susceptible to erosion (River Run Consulting 2006:22). The results of analysis of the historical aerial photographs from 1940 and 1952 indicates the presence of meander cutoffs and straightening that would likely have prompted incision that propagated upstream and could have been accelerated by rain-on-snow floods in 1955, 1963, and 1964.

The longitudinal profile of the Upper Truckee River in the study area has been surveyed four times in the last 15years: by State Parks in 1993, 1994, and 2002 and by SH&G in May 2003. The profiles display changes in streambed elevation over time, including results of recent changes after the 1997 rain-on-snow flood (SH&G 2004a:III-20). The series of longitudinal profiles imply the movement of knickpoints through the study area, which lowers the streambed elevation. An episodic streambed profile modification process occurs because erosion rates are initially slow as the stream attempts to erode through the resistant deposits and then speed up after the river penetrates to less resistant materials (River Run Consulting 2006:35).

Although the overall slopes of the channel and valley in this vicinity are less than 1 percent overall, there is variability. The existing (2003) profile displays several key features, including a flatter section in the downstream half with steeper sections upstream, and the detail of the profile includes local pools, bars, and the effect of resistant knickpoints (Exhibit 3.4-2). An existing grade control structure comprised of small to medium boulders has been in place since the 1960s at RS 2100 to protect the water intake for the golf course (SH&G 2004a:III-20).

The protection has likely supported the local channel bed elevation (River Run Consulting 2006:35), as shown by the nearly level streambed slope for several hundred feet upstream (Exhibit 3.4-2).

The streambed and adjacent surface downvalley slope varies by major river reach in the study area (Table 3.4-6), reaches whose underlying characteristics are inherited from the glacial history (see Table 2.1-1 for reach descriptions). The downstream meadow reach (Reach 1) has a broader valley, would have been inundated by high lake stands in the geological past, and contains finer grained deposits. It has the lowest average bed slope, and historically would have been connected to a meadow floodplain that flooded nearly every year. The transition reach (Reach 2) near the middle of the study area adjusts from the narrower valley upstream to a broader valley downstream and the bank and bed sediments transition from coarser glacial outwash to somewhat finer material. Here the vegetation converts from forest to meadow and this reach has the highest streambed slope (Table 3.4-6), which may reflect the locally steeper valley slope across outwash delta deposits (River Run Consulting 2006:35). The upstream reach (Reach 3) has a relatively steep slope and narrow valley confined by glacial moraine and outwash deposits. It is naturally slightly incised in glacial moraine and outwash material, but disturbance has increased this incision.



Source**:** Valley & Mountain Consulting unpublished, data provided by California Department of Parks and Recreation in 2008

Streambed and Streambank Profiles on the Existing Upper Truckee River Alignment **Exhibit 3.4-2**

Table 3.4-6 Existing Streambed and Streambank Downvalley Slopes			
Study Area Reach	Average Streambed Slope (%)	Left Bank Average Slope (%)*	Right Bank Average Slope (%)*
1	0.151	0.145	0.097
2	0.316	0.450	0.135
3	0.224	0.135	0.252

Notes:
* Left and right banks are referenced from the perspective of viewing the river facing downstream
Source: Valley & Mountain Consulting unpublished, survey data provided by California Department of Parks and Recreation and SH&G

Upper Truckee River Channel Capacity

Historical alterations of the watershed and channels, along with subsequent channel responses have enlarged the cross-sectional area of the Upper Truckee River channel through incision and widening. Channel enlargement has increased channel capacity throughout the study area, and reduced the frequency of overbank flows and areas inundated by small to moderate peak streamflows (for additional details, see the overbanking and active floodplain discussion within Section 3.3, “Hydrology and Flooding”). The degraded overbanking frequency and inundation areas for peak flows at the geomorphic bankfull magnitude (1.5-year) and up through the 5-year and 10-year events impairs floodplain processes normally protective of water quality, such as physical settling of sediment and nutrient trapping and uptake. Additionally, the adverse hydraulics associated with the enlarged channel increases stress on the streambed and streambank toe, fostering erosion that contributes sediment and nutrient pollutants directly to the stream.

Upper Truckee River Channel Erosion

The channel along the Upper Truckee River in the study area has experienced substantial erosion historically as the stream adjusted to direct and indirect disturbances, including both streambed erosion (incision) and streambank erosion (widening) phases. Channel instability is continuing as the stream adjusts to past channel modifications, and maintenance of golf course infrastructure often requires bank stabilization treatments and repairs (River Run Consulting 2006:7). The dominant erosion process in the study area at present is widening, causing accelerated bank erosion that affects Lake Tahoe water quality since many of the streambanks in the study area have large proportions of fine sediment (River Run Consulting 2006:16).

Several rock riprap revetments were installed around 1970 along the streambanks in the golf course area to stabilize banks and protect bridge abutments, sewer line crossings, and other golf course infrastructure (see Exhibit 2-3 and Appendix B, Table 4). Some of these treatments were successful at eliminating local erosion for a period of years, but many have partially or completely failed and they often caused erosion upstream and downstream of the installation (SH&G 2004a:II-21). In the early 1990s, bioengineered structures (e.g., logs and root wads with cobble revetments) were placed to stabilize other banks and/or replace prior failed treatments. Long-term or reach-scale success has been limited, and some have been completely eroded away due to the lack of grade stabilization or scour protection at the toe of bank (SH&G 2004a:II-21), coupled with the small percentage of channel length treated. Overall, these past attempts to control bank erosion have created localized areas of more erosion resistance, but only about one-third of the treated areas continue to function to prevent erosion at present (Appendix B, Table 4), and these are only a small portion of the overall eroding banks.

Simon et al. (2003) measured historical channel erosion or “channel activity” in terms of the mean rate of lateral migration for the Upper Truckee River by using aerial photographs from 1940 to 1994. In the study area, channel activity was high for 1940–1952 (1.08 to 1.65 square meters per kilometer per year [m2/km/year]) and decreased to moderately high for 1952–1971 (0.73 to 0.94 m2/km/year) and moderate for 1971–1994 (0.66 to 0.73

m2/km/year) (Simon et al. 2003). Overall, channel activity generally decreased from 1940 to 1994, which correlates to a gradual reduction in sediment yield over the same period of record (River Run Consulting 2006:34). However, the channel remains unstable and there is active erosion, with this reach rated as moderate to high bank erosion hazard using field survey methods that were applied consistently throughout the Tahoe Basin (Simon et al. 2003:4-15). The study did not include data from the 1997 flood event in which the reach again experienced high rates of erosion or accelerated “channel activity”.

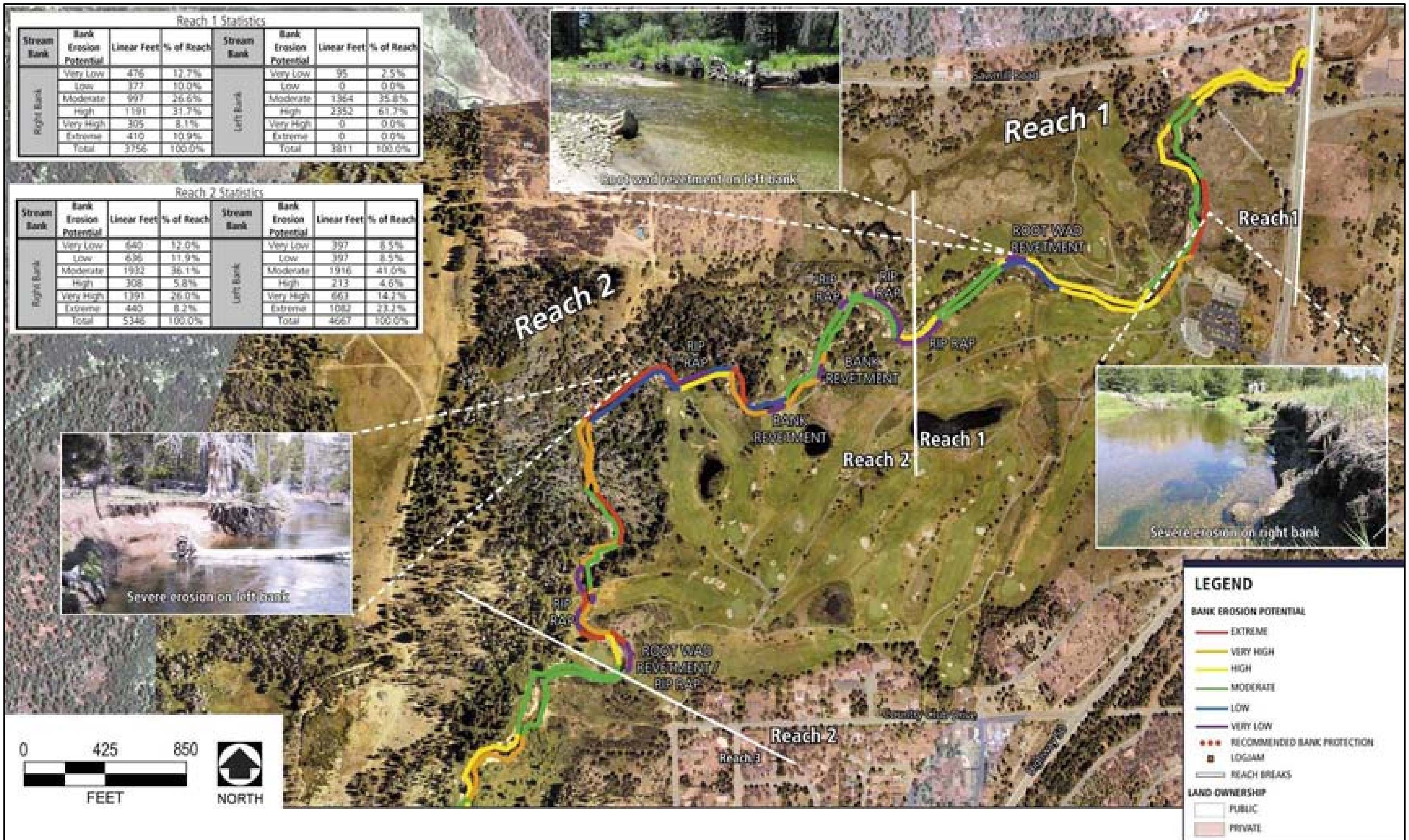
Cross sections monitored by State Parks since 1992 show continuing bank erosion and bed incision in recent years (since the 1994 historical aerial analysis) (SH&G 2004a:III-28). Substantial erosion occurred at several sites after the 1997 flood event, with the most change in the upstream transects (River Run Consulting 2006:35). Aside from the major flood events, recent channel dynamics have been limited to small-scale changes, such as minor meander migration, local bank failure, and continuation of minor incision.

In 2003, SH&G conducted a field survey and streambank erosion hazard potential inventory for the banks along the entire upper reach of the Upper Truckee River that included the study area (the existing study area overlaps with SH&G Reaches 1 and 2) (Exhibit 3.4-3). The results show numerous areas of unstable banks undercutting bank vegetation. Many of the banks have high erosion hazard and are sources of fine sediment (SH&G 2004a:III-41) that can be mobilized and transported to the lake.

Streambank erosion is controlled by numerous factors, but one of the key driving forces is related to bank height above the streambed. In the study reaches, the history of channel bed incision has resulted in bank heights that are more than 7 feet tall on average (Exhibit 3.4-4). Streambanks are consistently high throughout the project reaches, and only a few areas have banks less than 5 feet high (e.g., left bank at RS 1200 and RS 10200 or right bank at RS 6200 and RS 8400). Thus the water table is low throughout much of the growing season and the banks cannot support riparian vegetation that can improve bank material cohesion. Instead of over-banking and spreading energy onto the floodplain, the erosive force is contained in the channel exacerbating erosion of the banks.

Studies for the Lake Tahoe total maximum daily load (TMDL) identified the Upper Truckee River as the largest source of fine sediment from streambank erosion to the lake (Simon et al. 2003:ES-1, Simon 2006:618). For the entire Upper Truckee River, the average annual streambank erosion rate for fine sediment (i.e., sediment that is smaller than 0.063 millimeter in diameter) is 639 tons per year which is approximately 63 percent of the total fine sediment from its entire watershed (Simon 2006:635). The large percentage of watershed total fine sediment loads emanating from streambanks along the Upper Truckee River indicates the importance of bank instability for water quality.

The TMDL analysis of load reduction opportunities (California Water Boards and NDEP 2007:211–215) produced quantitative estimates of erosion of fine sediment from streambanks of the Upper Truckee River, including estimates covering the study area reaches (Table 3.4-7). The study area reaches span 16.3 percent of the total length of the Upper Truckee River studied in the analysis but generates 19.5 to 22.7 percent of the fine sediment eroded from streambanks, which indicates that the study area reaches have proportionally more streambank erosion than other reaches of the river. This is not unexpected, because the study area has some steeper slopes, a moderately high percentage of banks actively failing, and a larger proportion of fines in the banks than other reaches. The results of the TMDL study (Table 3.4-7) indicate that locations in Subreach 3C/3D have the highest fine sediment from bank erosion in the study area. These data are consistent with the relative pattern of bank failure observed by SH&G (2004a) in the study area. Although the absolute values of estimates from the TMDL analysis of load reduction opportunities should not be considered precise, these estimates provide useful data for comparisons among various alternatives.



Reach 1 Statistics

Stream Bank	Bank Erosion Potential	Linear Feet	% of Reach	Stream Bank	Bank Erosion Potential	Linear Feet	% of Reach
Right Bank	Very Low	476	12.7%	Left Bank	Very Low	95	2.5%
	Low	377	10.0%		Low	0	0.0%
	Moderate	997	26.6%		Moderate	1364	35.8%
	High	1191	31.7%		High	2352	61.7%
	Very High	305	8.1%		Very High	0	0.0%
	Extreme	410	10.9%		Extreme	0	0.0%
	Total	3756	100.0%		Total	3811	100.0%

Reach 2 Statistics

Stream Bank	Bank Erosion Potential	Linear Feet	% of Reach	Stream Bank	Bank Erosion Potential	Linear Feet	% of Reach
Right Bank	Very Low	640	12.0%	Left Bank	Very Low	397	8.5%
	Low	636	11.9%		Low	397	8.5%
	Moderate	1932	36.1%		Moderate	1916	41.0%
	High	308	5.8%		High	213	4.6%
	Very High	1391	26.0%		Very High	663	14.2%
	Extreme	440	8.2%		Extreme	1082	23.2%
	Total	5346	100.0%		Total	4667	100.0%

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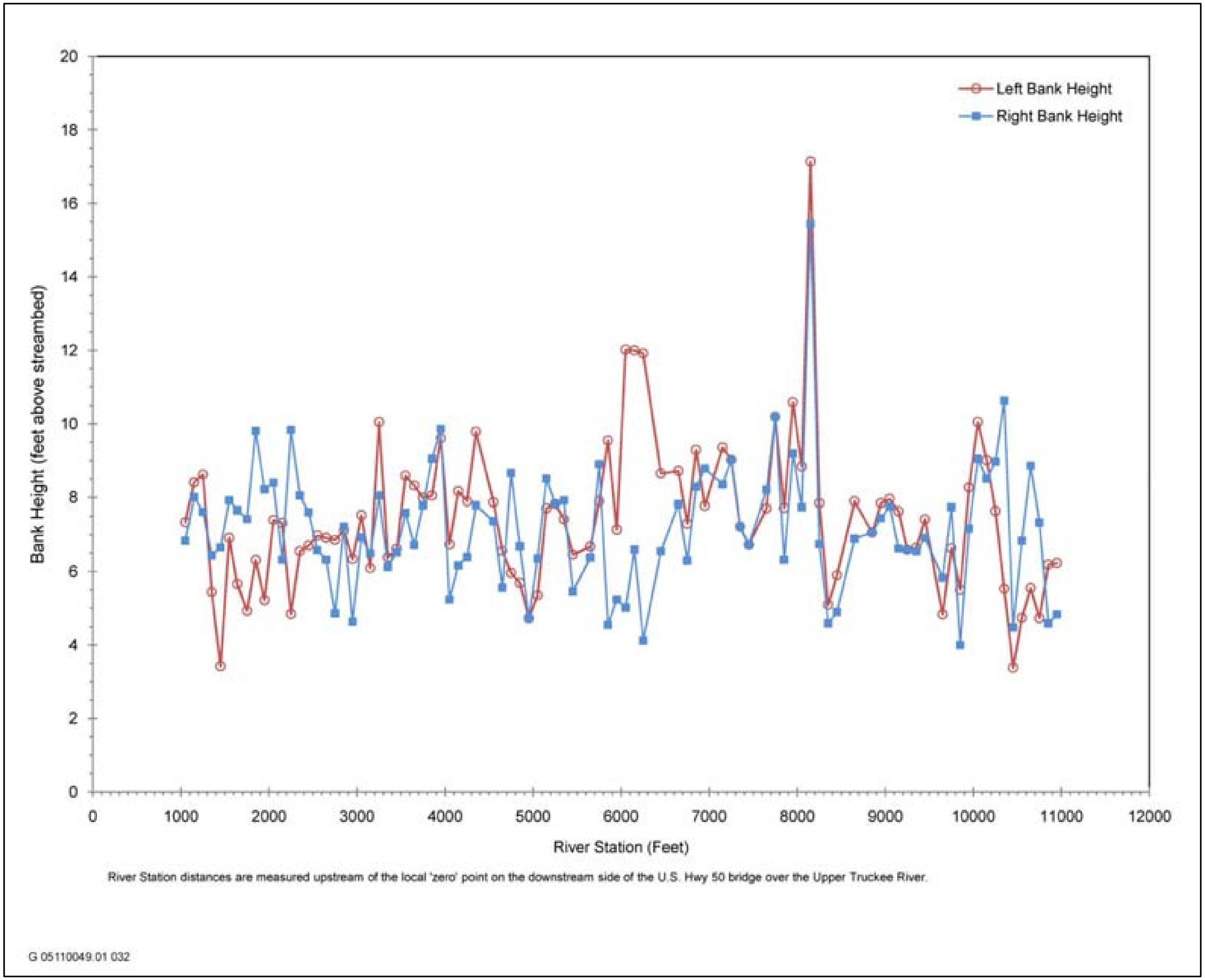
Source: SH&G 2004a

Existing Streambank Erosion Inventory (2003) **Exhibit 3.4-3**



Source: Valley & Mountain Consulting unpublished, data provided by California Department of Parks and Recreation in 2008

Existing Streambank Heights **Exhibit 3.4-4**

Table 3.4-7 Estimated Stream Channel Bank Erosion on the Upper Truckee River in the Study Area for Above-Average Streamflow Year and Event					
River Station (feet above mouth of river)	Associated Study Area Reach(es)	Length (feet)	Percent Bank Failing (% of length)	Estimated Existing Bank Erosion of Fine Sediment (cubic yards)	
				Assuming Upper Truckee River Average % Fines[1] Bank Composition	Assuming Reach-Specific % Fines[1] Bank Composition
Upper Truckee River Entire Watershed					
Upper Truckee River Total		81,693	20.2	4,174	4,320
Upper Truckee River in Study Area					
35,564 to 36,778	1A to 1D	2,625	12.6	115.2	149.2
36,778 to 39,600	1E	1,214	16.8	153.0	197.2
39,600 to 43,143	2 to 3A	2,822	21.1	19.2	24.8
43,143 to 44,357	3A to 3C	3,543	14.9	136.3	173.7
44,357 to 46,260	3C/3D	1,214	14.9	372.0	413.3
46,260 to 48,458	3D	1,903	17.3	15.8	23.2
Study Area Subtotal	11,840	13,320	–	811.7	981.4
Study Area as Percent of Upper Truckee River		16.3	–	19.5	22.7

Note: [1] Fine sediment is less than 0.063 millimeter in diameter.
Source: Lahontan RWQCB and NDEP 2007

Water Quality

"Water quality" refers to a combination of characteristics (parameters) that can be quantitatively or qualitatively described for a given water body. The parameters include pollutants, such as nutrients, suspended sediment, bacteria, and toxic elements or chemicals, as well as attributes important to biological resources, such as pH, dissolved oxygen, and temperature. The pollutants of concern for the Upper Truckee River are sediment; nutrients, nitrogen and phosphorus; iron; and, to a lesser degree, heavy metals, pesticides, and hydrocarbons (SH&G 2004a:III-2). The Upper Truckee River is included in the 2006 CWA 303(d) listing of impaired water bodies for phosphorus and iron above and below and for pathogens above Christmas Valley. Since the 1960s, Lake Tahoe has been losing its clarity at a rate of nearly 9 inches per year and has failed to meet transparency and clarity standards (Lahontan RWQCB and NDEP 2007). Lake Tahoe is included in the 2006 CWA 303(d) listing of impaired water bodies for nitrogen, phosphorus, and sedimentation/siltation. Development of the TMDL is under way to identify the pollutant sources, quantify the amount of pollutants that the lake can accept, determine options for reducing pollutants, and provide an implementation plan and monitoring plan (Lahontan RWQCB and NDEP 2007). TMDL research has established that Lake Tahoe is impaired by excess inputs of nutrients (nitrogen and phosphorus) and fine sediment. Nitrogen and phosphorus stimulate algae growth, which in turn absorbs light and reduces light penetration through the water (Reuter and Miller 2000). Fine sediments decrease clarity by scattering light as the particles slowly settle through the water (Lahontan RWQCB and NDEP 2007). Fine mineral particles (i.e., particles less than 20 microns in diameter) have been shown to strongly affect clarity and may be responsible for 60 percent or more of the transparency loss (because of their effect on light scattering) (TRPA 2007b).

There are several potential pathways for nutrients, fine sediment, and other pollutants to enter waters of the study area and be released downstream to the lake. Several potential sources, sinks, and transformations of these constituents may occur in the study area. Sources include streamflow (from and upstream of the study area, Angora Creek, and the unnamed creek), golf course and urban stormwater runoff (from turf, ponds, ditches, and roadways), groundwater, and direct atmospheric deposition. Watershed and site-scale monitoring of water quality has been performed at varied times for various purposes, but site-specific data are limited. Some site-specific assessments of water quality issues have been performed by staff members of the Lahontan RWQCB as part of periodic inspections related to the waste discharge permit (Lahontan RWQCB 2000a) under which the existing golf course operates. The information below is focused on topics that describe the existing water quality in the study area or water quality parameters that may be altered by the action alternatives.

Stream Water Quality

Stream water quality sampling at the gauge station on the Upper Truckee River downstream of the study area near U.S. 50 in the City of South Lake Tahoe has been ongoing since 1980. Sampling data from the gauge station presented in this paragraph are drawn from analysis for the Upper Truckee River and Marsh Restoration Project Draft EIR/EIS/EIS (EDAW in prep.). Nutrient concentrations in the Upper Truckee River often exceed Basin Plan objectives and TRPA threshold criteria. Average annual concentrations of total phosphorus in the Upper Truckee River exceeded the Basin Plan objective of 0.015 mg/L in all years and exceeded the TRPA threshold criteria of 0.03 mg/L in approximately two-thirds of the years. Average annual total nitrogen concentrations exceeded the Basin Plan objective of 0.19 mg/L in 76 percent of the years on the Upper Truckee River. The TRPA total nitrogen standard of 0.22 mg/L was exceeded in 41 percent of the years on the Upper Truckee River. The total iron concentrations in the Upper Truckee River has been sampled only since water year 1989, but they have consistently exceeded the Basin Plan objective and TRPA standard of 0.03 mg/L, perhaps because of high natural background levels. The average annual total suspended sediment concentrations on the Upper Truckee River exceeded the TRPA standard of 60 mg/L in only one year.

An evaluation of median suspended-sediment concentrations of the 10 largest tributaries to Lake Tahoe from 1993 to 1998 indicated that the Upper Truckee River at U.S. 50 in the city of South Lake Tahoe ranked sixth (Rowe et al. 2002). During this period, the minimum concentration of suspended sediment in the Upper Truckee River was 1 mg/L, the maximum was 458 mg/L, and the median was 16 mg/L.

Monthly suspended sediment loads on the Upper Truckee River demonstrate, as expected, year-to-year variations that generally track precipitation and overall streamflow volume variations (Rowe et al. 2002). Annual suspended sediment loads on the Upper Truckee River for all years of record since 1960 (using the sediment rating curves from Simon et al. 2003 and Simon 2006) also display a wide range of values, from less than 1,000 tons per year (during drought years) to approximately 8,000 tons per year or more (during the 1983 water year and during 1997) (EDAW in prep.). Various estimates of average suspended sediment loads for the Upper Truckee River have been calculated by different studies for different data periods (Table 3.4-8), all within the same order of magnitude.

The calculated annual load of fine sediment (less than 0.063 millimeter in diameter) for the Upper Truckee River is 1,010 tonnes per year (or metric tons per year) using mean-daily flow data and the sediment-rating relations developed by Simon et al. (2003) (Simon 2006). This value is approximately 19.40 percent of the total suspended load of the Upper Truckee River. In terms of both fine sediment load and fine particle flux, the Upper Truckee River is the greatest throughout the Lake Tahoe Basin (Simon 2006). Although the suspended sediment yields (per unit watershed area) estimated for the Upper Truckee River (6 tons per year per square mile) are moderate relative to other watersheds at Lake Tahoe, the sheer size of this watershed enlarges its load to Lake Tahoe (Simon et al. 2003).

Table 3.4-8
Published Annual Suspended Sediment Loads (Tons/yr) for the Upper Truckee River from Measured Data

Water Years	Suspended Sediment Loads for Upper Truckee River (tons per year)
1989–1996	3,310 ([mean or median?])[1]
1972–1974	3,900 ([mean or median?])[2]
1972–2002	2,850 (mean)[3]
1972–2002	2,200 (median)[3]

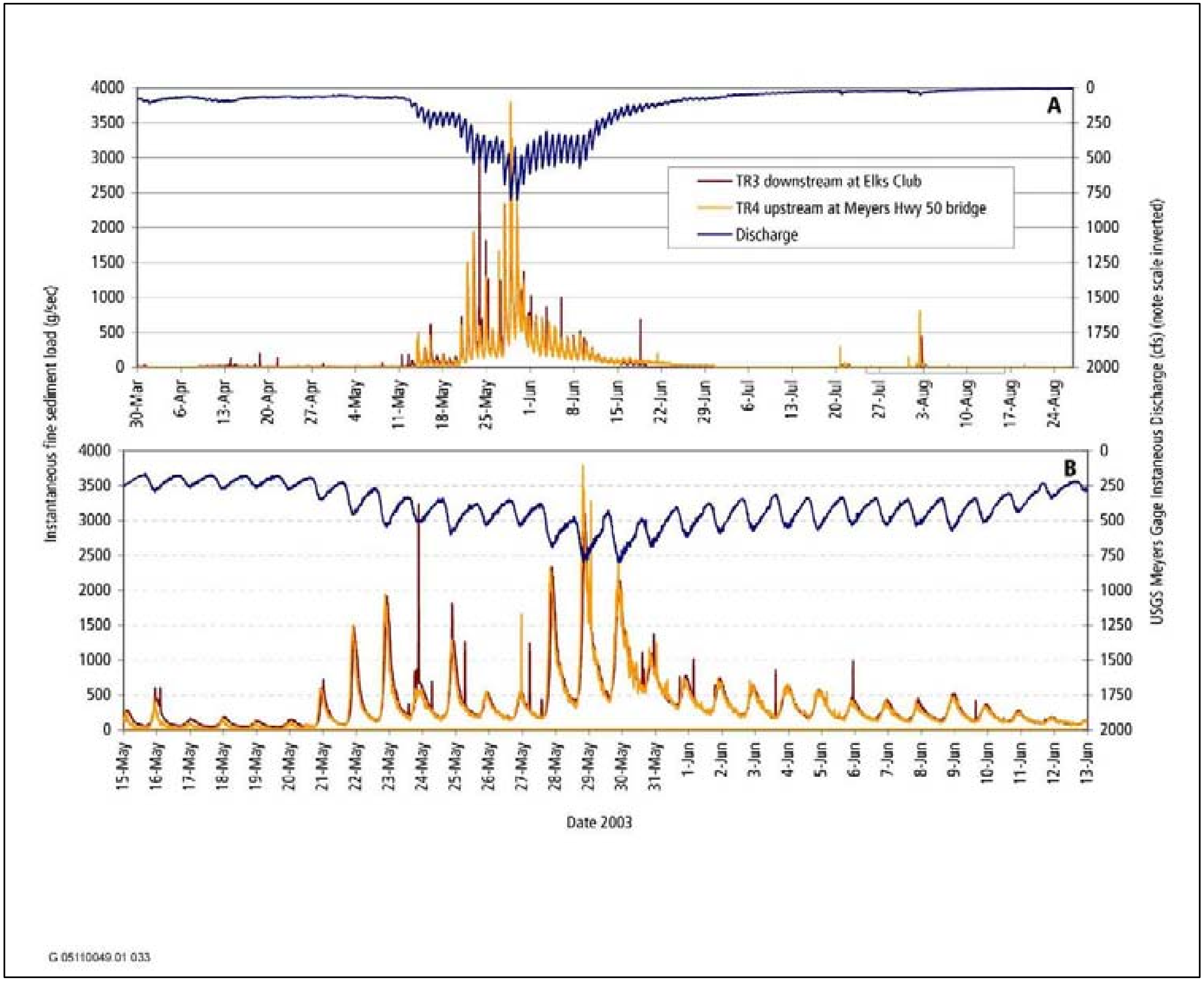
[1] Source: Reuter and Miller 2000
[2] Source: Kroll 1976
[3] Source: Simon et al. 2003

Rowe et al. (2002) found that the seasonal pattern of sediment loadings generally follows runoff, with the highest seasonal median loads of suspended sediment for the Upper Truckee River occurring during the snowmelt months of April, May, and June. The largest median monthly loads for all measured constituents occurred in May. The lowest seasonal loads occurred in summer (July, August, and September), with the lowest monthly loads usually in August, September, or October (Rowe et al. 2002).

Statistical analysis has been conducted to look at trends over time in suspended sediment and other constituents (Rowe et al. 2002, Simon et al. 2003). Simon et al. 2003 identified a possible decreasing trend in annual loads on the Upper Truckee River and concluded that the Upper Truckee River had decreasing mean daily concentrations. These data may indicate long-term watershed recovery from past disturbances, and the patterns are similar for concentrations of total and fine-grained sediment (Simon et al. 2003).

Shifts in the rating curves for suspended sediment also highlight changes over the period of record, with loads on the Upper Truckee River first increasing during 1983–1992, then decreasing from 1993 through 2002, to values lower than those during 1972–1982 (Simon et al. 2003). Short-term analysis of suspended sediment data from before and after the 1997 flood event showed a statistically significant decrease in the rating curve after the flood event (Simon et al. 2003). The decrease resulted from flushing of readily available sediment from the channel system by the major flood event.

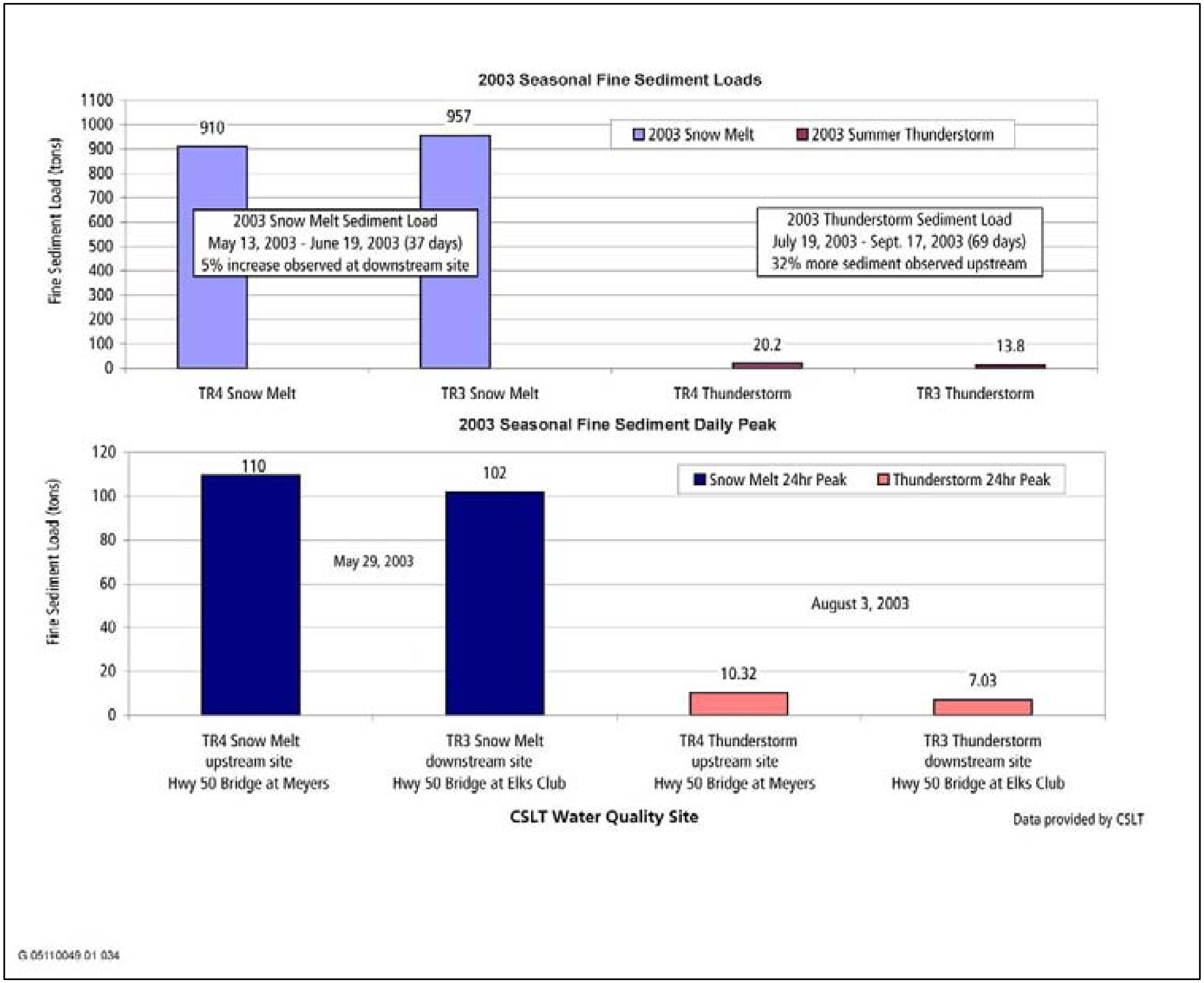
The City of South Lake Tahoe collected turbidity measurements and periodic samples of nitrogen and phosphorus during high flows in the Upper Truckee River upstream and downstream of the study area during 2002 and 2003 (SH&G 2004a:I-14, I-15). SH&G calibrated the turbidity readings (nephelometric turbidity units) to total suspended sediment (TSS) concentrations using grab-sample TSS data and rating curves and reported on TSS loads at the upstream and downstream ends of the study area. Spring snowmelt conveys a consistent fine sediment load, whereas flashy summer thunderstorms often convey high amounts of sediment in a short period of time (Exhibit 3.4-5). The results showed the sustained elevated flows during a spring snowmelt produced a total fine sediment load of more than 900 tons during the 37-day period in 2003, an order of magnitude higher than the summer thunderstorm series of 69 days (Exhibit 3.4-6). It was also reported that, based on field observations and the data, the fine sediment loads likely increase downstream through the study area as a result of local bank erosion (SH&G 2004a:III-8). For the same sampling period in 2003, the grab-sample concentrations of total Kjeldahl nitrogen (TKN) remain relatively consistent over the sampling selection, but values of total phosphorus were much higher during the summer thunderstorm in August 2003, likely because of the high loads of fine sediment observed during the flashy event (SH&G 2004a:III-13). No distinct downstream trend was noted (Exhibits 3.4-7 and 3.4-8).



(SH&G 3.7A & B)

Continuous Fine Sediment Loads and
Streamflow Upstream and Downstream of the Study Area, 2003

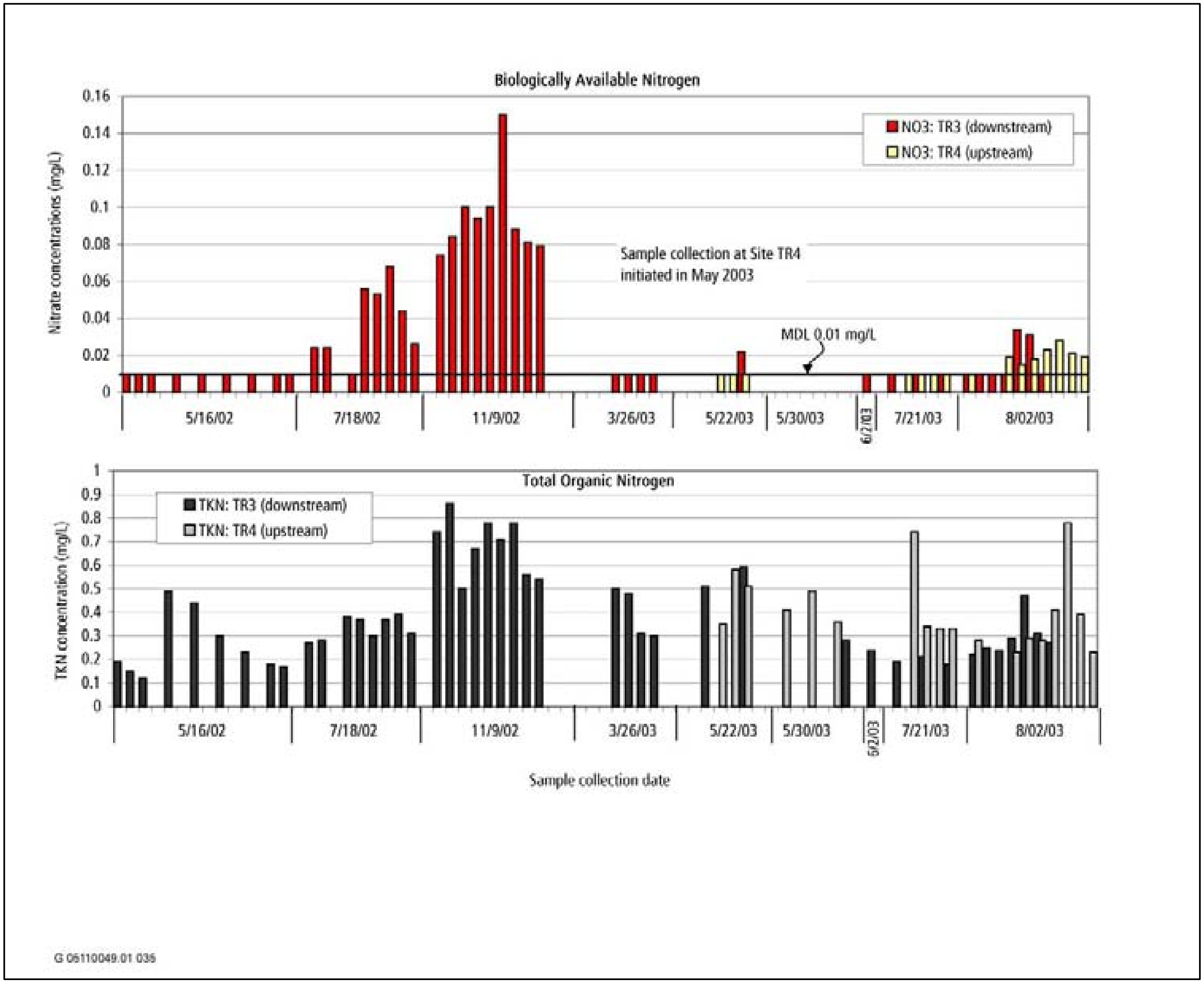
Exhibit 3.4-5



(SH&G 3.8)

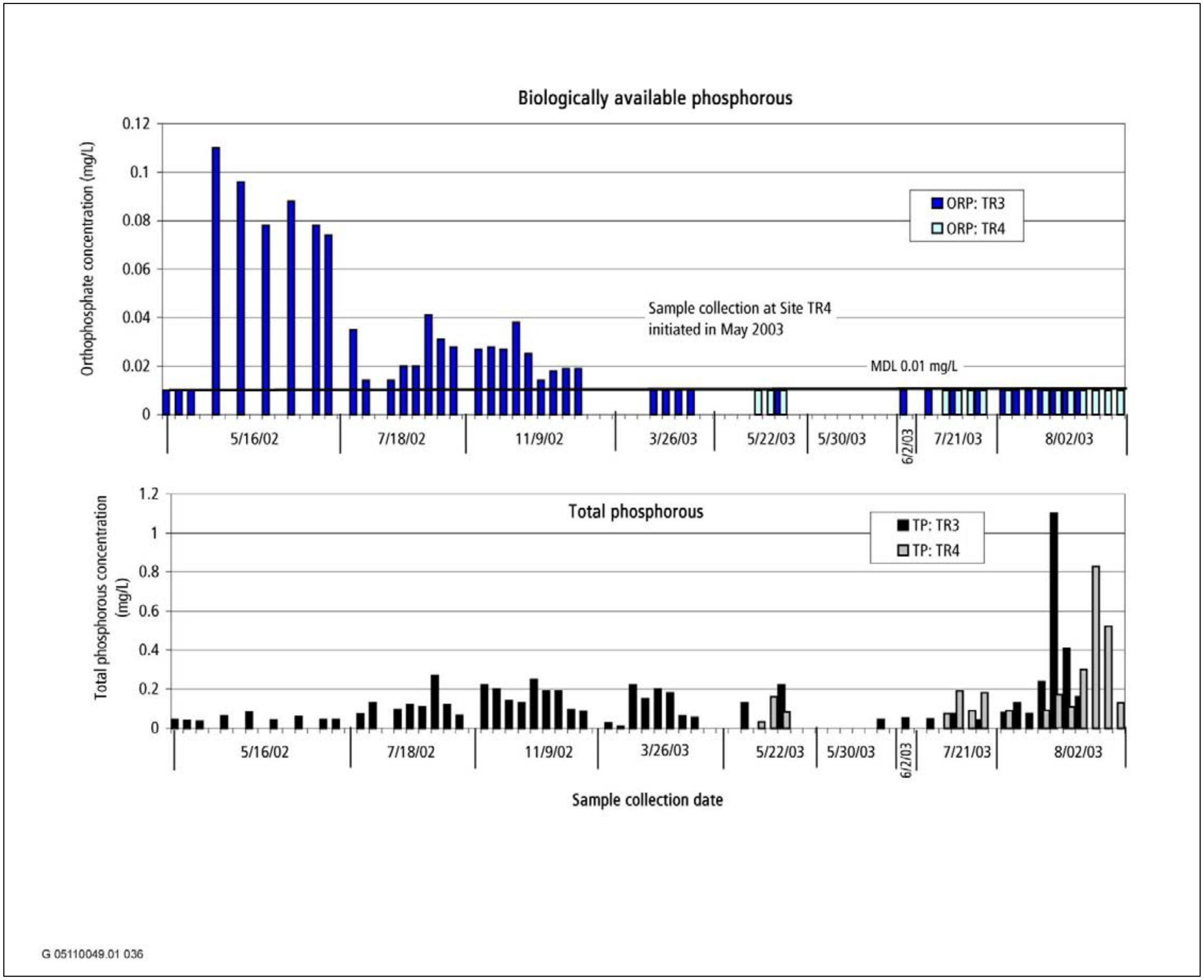
Seasonal and Peak Loads of Fine Sediment
Upstream and Downstream of the Study Area, 2003

Exhibit 3.4-6



(SH&G 3.9)

Concentrations of Nitrogen (as Nitrate and TKN)
Upstream and Downstream of the Study Area, 2003 **Exhibit 3.4-7**



(SH&G 3.10)

Concentrations of Phosphorus (as Orthophosphate and Total Phosphorus)
Upstream and Downstream of the Study Area, 2003

Exhibit 3.4-8

Floodplain Processes

Stream channel and floodplain connections, active floodplain areas, and overbanking processes that prompt fine sediment deposition and nutrient retention are degraded in the study area and along the other reaches of the Upper Truckee River relative to natural conditions as a result of past watershed-wide and site-specific direct actions and the stream's geomorphic response to those actions. The river channel is enlarged, banks are high, and fill has been placed in some floodplain areas. These have reduced overbank flow frequency and the extent of active floodplain (See Exhibit 3.3-14). This, in turn, has decreased the opportunity for, and effectiveness of floodplain deposition of suspended sediment and/or the trapping and transformation of attached or dissolved nutrients. Studies for the Lake Tahoe TMDL have documented the existing degraded condition along the Upper Truckee River; reported the magnitude of total and fine sediment loads, and calculated nutrient loads delivered to Lake Tahoe based on USGS records (Simon et al. 2003; Simon 2006; California Water Boards and NDEP 2007). The loads reaching the lake reflect the net effect of numerous sources and sinks (or storage) throughout the watershed and along the stream corridor, not just the floodplain processes. The TMDL studies included estimates of several of the watershed pollutant sources and opportunities to reduce loads from those sources (California Water Boards and NDEP 2007). However, little quantitative information is available about the degree of impairment of floodplains as a sink for sediment and nutrients along the Upper Truckee River relative to a natural or undisturbed condition.

Conceptual models linking channel and floodplain characteristics to sediment and nutrient sources and sinks and some limited field data have been the basis of discussions of the existing versus restored conditions to-date (EDAW and ENTRIX 2003:Chapter 12; California Water Boards and NDEP 2008:Stream Cannel Erosion Load Reduction Analysis, Appendix F). While no field data regarding overbank flows and floodplain sedimentation has been reported for the study area, a few studies have collected information downstream within the Upper Truckee Marsh. Analysis of soil cores documented modern net sedimentation in the Upper Truckee Marsh even under the degraded channel conditions, but at rates that only capture a small portion of the suspended sediment in the streamflow entering the area (Winter 2003:90). Observations at seven sampling sites in the marsh during the 2003 snowmelt season identified patterns and amounts of suspended sediment (SS) and total phosphorus (TP) retention on the Upper Truckee River versus Trout Creek portions (Stubblefield et al. 2006). These field data indicate that the more functional floodplain along Trout Creek retained 68 to 90 percent of the SS, and 61to 85 percent of the TP, while areas along the degraded Upper Truckee River retained only 26 percent of the SS and 24 percent of the TP (Stubblefield et al. 2006). Conceptual models of floodplain processes and the limited local data both suggest that impaired floodplain connectivity and floodplain conditions, limit net sedimentation and nutrient retention as water quality treatment along the Upper Truckee River.

Three on-going research projects funded in late 2007 have just completed two years of data collection on various portions of the Upper Truckee River and Trout Creek to study existing overbank flows and floodplain sedimentation, streambank processes, and to test and improve computer simulations of channel dynamics and floodplain processes:

- "Methodology to Predict Total and Fine Sediment Load Reductions as a Result of Channel Restoration in Lake Tahoe Streams" 2ndNature, Santa Cruz, CA. Nicole Beck, Principal Investigator.

- "Numerical modeling of the effects of floodplain morphology and vegetation on sediment retention: Implications for river restorations in the Lake Tahoe Basin, California-Nevada, USA" University of California, Davis, CA. Geoffrey Schladow, Principal Investigator and Stephen Andrews, researcher.

- "Application of Enhanced Stream-Corridor Modeling Tools for Adaptive Management of Tahoe Basin Streams" USDA-ARS National Sedimentation Laboratory, Oxford, MS. Eddy Langendoen and Andrew Simon, Principal Investigators.

At this time, none of the on-going research projects have results available to quantify the net effects on water quality associated with existing or proposed channel capacity, bank heights, floodplain elevation and slope, and vegetation type and density.

In the absence of empirical data or calibrated models to estimate potential quantities of fine sediment and nutrient trapping by floodplain processes, the area inundated by frequent small streamflow events (i.e. the 2-year recurrence) serves as a proxy (Table 3.4-9). As the frequency of overbanking opportunities and the area inundated by a particular magnitude streamflow increases, the duration of time that floodwaters would be spread out on the active floodplain also increase. The specific changes in duration are difficult to quantify, since they depend on floodplain topography, flow paths, and vegetation resistance, but increased duration of floodwater on the floodplain would improve the trapping of fine sediment and nutrients.

Table 3.4-9
Estimated Active Floodplain[1] Area along the Upper Truckee River Project Reaches

River Reach*	Area of Active Floodplain[2] Existing (acres)
Upper Truckee Marsh (downstream of U.S. 50)	65.0
Middle Upper Truckee River, Reaches 1 and 2 [3]	na
Middle Upper Truckee River, Reaches 3 and 4	0
Middle Upper Truckee Rver Reaches 5 and 6 (Sunset Stables)	58.0
Washoe Meadows State Park/Lake Valley State Recreation Area	35.7
Total	**158.7**

Notes:
* River Reaches herein are those identified for the enture Upper Trucke River, not just the Study Area. Middle Upper Truckee River extends between the U.S. Hwy 50/Lake Tahoe Blvd. crossing to the U.S. Hwy 50 crossing by Elks Club.
1 Active floodplain" is defined as the area inundated from a 2-year recurrence peak streamflow event.
2 The range of active floodplain areas for the alternatives under consideration is listed for projects that have not yet selected a preferred alternative or final design.
3 No quantitative estimate of floodplain area has yet been calculated or modeled for these reaches (Rudd, pers. comm., 2008).
Sources: EDAW and ENTRIX 2005; ENTRIX 2006; ENTRIX 2008; California Department of Parks and Recreation 2008

Golf Course Runoff

At this time, no definitive conclusions regarding water quality impacts of the existing Lake Tahoe Golf Course have been drawn from surface-water nutrient data collected by the City of South Lake Tahoe and the U.S. Geological Survey (SH&G 2004a:III-13). Efforts by TRPA and the Lahontan RWQCB to reduce the concentration of phosphorus (P) applied to turf and manicured lawns produced strict requirements for fertilizer management at golf courses and recreational facilities in the last 10–15 years (SH&G 2004a:III-13). Existing golf course operations are conducted under an updated waste discharge permit and associated monitoring and reporting program from Lahontan RWQCB (Lahontan RWQCB 2000a, 2000b). For the purposes of Board Order No. 6-00-48, State Parks (as land manager) and American Golf (as lease holder) are considered as "the discharger," and the golf course and its routine operation and maintenance are referred to as "the facility." Before the 2000 update, the facility operated under Board Order No. 6-89-9, which was adopted on January 12, 1989. The waste discharge requirements for the facility include compliance with discharge limitations and receiving water limitations consistent with the Basin Plan. In compliance with the updated permit, the golf course prepared a maintenance plan that included a " chemical plan, an irrigation plan, an agronomic plan, an erosion control plan, and reporting requirements (Lake Tahoe Golf Course and Restaurant 2000).

Potential discharge of pollutants from the facility consists of nutrients from fertilizers and toxic compounds from the use of pesticides, products of erosion, construction waste materials, and small amounts of oil and grease contained in stormwater runoff from impervious surfaces, diesel fuel, and gasoline fuel from the two aboveground fuel tanks and the former underground tanks (Lahontan RWQCB 2000a). The potential for discharge of applied chemical compounds via surface runoff or shallow groundwater to the surface water of the Upper Truckee River is increased by the narrow and, in some sub reaches, non-existent buffer between intensively managed turf and the river channel. For example, no buffer between the golf course landscaping and the river is present at: RS 1800 to 2400 (on both sides of the river); RS 4700 (left bank); RS 5100 (both banks); RS 7500 to 7700 (left bank); and, RS 7700 to 8600 (both sides).

However, both the 2002 and 2004 Lahontan RWQCB field inspections concluded that the primary sources of water quality problems at the site are related to streambank erosion rather than to golf course management (Lake Tahoe Golf Course and Restaurant 2000:85, 87).

The monitoring and reporting program that began under the original (1989) permit established two surface-water monitoring and three roughly 15-feet deep groundwater monitoring wells (Lahontan RWQCB 2000a:1). Monitoring site SW-I is along the unnamed creek at the upstream (south) boundary of the golf course, and SW-II is downstream of SW-1 on the same unnamed creek. Monitoring results show little or no increase in constituents monitored in surface waters (nitrate plus nitrite, dissolved ammonia, orthophosphorus, turbidity, oil and grease, pesticides, and fungicides). Groundwater monitoring site GW-2 is located in a monitoring well at the upstream end of the study area, GW-3 is near the midpoint of the study area, and GW-1 is at the downstream end of the study area. A residential area adjacent to GW-2 may provide input to a relatively high concentration of background nutrients to the upgradient monitoring well. The upgradient well (GW-2) and the downgradient well (GW-1) seemed hydrologically connected in that the downgradient well tracks slugs of nitrate and orthophosphate, with a characteristic time lag of several months (indicating a relatively rapid rate of groundwater movement). Golf course fertilizer management practices seemed to be relatively well reflected by nutrient concentrations in GW-3.

Fertilizer use at the Lake Tahoe Golf Course is minimal, typically occurs twice per year in May and November. Most fertilizers used are slow release but some are not. Use of slow release fertilizer minimizes the amounts of fertilizer free in the soil solution which could be leached. Fertilizers used on site that are not considered slow release are applied either in as spoon fed on greens only (on approximately 2 acres,) or are applied in a manner which approximates a slow release feeding in that they are applied in such small quantities (per acre) that they do not overwhelm the soil’s ability to hold and then release to the plant to match growth rates. No nitrates are applied, nitrates are negatively charged, as is the soil, have no holding ability in the soil therefore whatever the plant doesn’t uptake or attach to its roots would be lost to the groundwater below. Fertilizer use is focused on fairways, tees, and greens, and not within the rough or ‘minimally managed’ areas. Buffer zones are located along some fairways adjacent to creeks and ponds. However, some fairways located adjacent to the river currently have no buffer. Herbicides are used only in spot treatments and pesticide use is also very minimal.

3.4.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, the environmental thresholds of the Tahoe Regional Planning Compact were also considered. The project’s effects on thresholds are further described in Chapter 4, Section 4.6,“Consequences for Environmental Threshold Carrying Capacities.”

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, a geomorphology and water quality impact is considered significant if implementation of the project would do any of the following:

- violate any water quality standards,
- create or contribute to runoff water that would include substantial additional sources of polluted water, or
- otherwise substantially degrade surface water or groundwater quality.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on geomorphology and water quality if it would:

- result in continuation of or increase in wind or water erosion of soils;

- create changes in deposition or erosion of beach sand, or changes in siltation, deposition, or erosion, including natural littoral processes, that may modify the channel of a river or stream or the bed of a lake;

- result in discharge into surface waters or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity; or

- result in the potential discharge of contaminants to the groundwater or any alteration of groundwater quality.

- result in an effect on drinking water sources located within 600 feet of the project.

Methods and Assumptions

The impact analysis has been completed using a combination of quantitative and qualitative methods performed by a hydrologist/geomorphologist and civil engineer experienced in river restoration in general and the Lake Tahoe Basin environment specifically. Information for the project site and vicinity and professional experience on similar projects have been referenced and incorporated into the analysis of the river system history, existing condition, likely future conditions, and conditions expected under each action alternative.

Climate change effects on future geomorphology and water quality are incorporated in the No Project/No Action Alternatives evaluation. However, even the most geographically and temporally focused available forecasts of climate change effects on hydrologic parameters (Tetra Tech 2007) have relatively large variability and substantial uncertainty. Due this variability and uncertainty, a range of climate change scenarios, not just end members or a midline scenario, are considered. Depending on the scenario, the statements are expressed in only qualitative terms.

The impact analysis examines the effects of each alternative over the short term and long term for each of the criteria listed above. Short-term effects are defined as those that would be temporary. The short-term, temporary effects include those that could occur over hours, days, or weeks during the active construction phase. In addition, the river system is expected to undergo changes following construction as vegetation matures and the river reoccupies and adjusts to the restoration project, so the short-term, temporary analysis also looks at interim effects that might occur during the first few years following construction, assuming streamflows are at least average, and also considers conditions if a large flood event (approximately 25-year peak flow) occurs within 5 years after construction.

Wherever Federal, State, or local water quality standards applicable for the region must be attained and maintained pursuant to Article V(d) of the TRPA Compact (TRPA 2004) , the strictest standards are used as the significance criteria for this project therefore, the project effects must meet or exceed such water quality standards to earn a less-than-significant conclusion, recognizing that any violation of a water quality standard is considered a water quality impact without taking in account the extent and duration of that impact. Based on informal agency consultations during alternatives development and analysis, the Lahontan RWQCB numeric and narrative water quality standards are the most stringent factors for significance determinations. Violation of any of the numeric water quality limits or narrative standards in the objectives of the Basin Plan (see Table 3.4-2 for examples), or actions inconsistent with the "Non-degradation" objective, would comprise a significant impact for this analysis. While it is possible that other water quality parameters could be affected by a project alternative, the "turbidity standard" (i.e., <10 percent above natural background) appears to be the most sensitive measure that is likely to be affected by potential construction in and along the river channel. The applicable limit is related to the Lahontan RWQCB's narrative turbidity standard for receiving waters in the Basin Plan, which states that: "Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent" (Lahontan RWQCB 1995:5.1-9).

Natural turbidity levels range widely by season with flow magnitudes and availability of sediment to be entrained. Over the past several years, most turbidity sampling on the Upper Truckee River has been conducted via grab samples as part of volunteer monitoring or research programs, along with some sampling during construction activities. For example, a citizen's volunteer water quality monitoring event, called Snapshot Day, held in May each year typically includes sites on the Upper Truckee River: in Christmas Valley; one in the downstream end of the middle reach (Mosher property); and a couple sites near the river's mouth. May 2002 samples had turbidity readings ranging from 0.12 NTU to 1.61 NTU (in the Mosher Reach). May 2003 samples had turbidity readings ranging from 0.3 NTU to 0.98 NTU (near the mouth). May 2005 samples had turbidity readings ranging from 2.43 NTU (near the mouth, but above Trout Creek) to 3.47 NTU (Christmas Valley) (TRPA data for 2002-2005). Additional grab samples were collected at two sites on the Upper Truckee River and two sites on Angora Creek on four dates in 2008 (January, March, the May 10th snapshot day, and in July), but none were over 4.5 NTU (Sierra Nevada Alliance 2008). During summer of 2008, Upper Truckee River and Angora Creek were sampled at multiple stations on the same dates as part of a Tahoe-Baikal Institute program. The Upper Truckee River samples ranged from less than 1 NTU at Meyers and by the Elks Club to less than 1.5 NTU at U.S. 50/Lake Tahoe Boulevard. The Angora Creek samples ranged from less than 0.5 NTU at the headwaters (by Angora Lakes) to just over 1 NTU at View Circle and nearly 3 NTU near the confluence with the Upper Truckee River (Tahoe-Baikal Institute 2008). Restoration project-specific water quality compliance monitoring for the Upper Truckee River Reaches 3 and 4 during construction included numerous grab samples between July 21 and September 4, 2008 along with continuous monitoring from September 5 to October 7, 2008 (Taylor, pers. comm. 2010), none of the grab samples were over 4 NTU. Median values during continuous monitoring remained between 1 and 3 NTU both upstream and downstream of the construction site for the restoration project, although a few brief spikes exceeded 10 and even 100 NTU for 10 to 20 minute periods. The brief turbidity spikes were associated with miscellaneous background disturbance (by recreation users and animals) upstream of the construction, as well as potential construction-related effects at least on one date (Taylor, pers. comm., 2010; ENTRIX, 2008).

The only continuous turbidity monitoring that spans multiple seasons and locations on the Upper Truckee River was conducted by the City of South Lake Tahoe (2nd Nature 2006). This monitoring included three sites along the Upper Truckee River beginning in April 2002 (for a partial Water Year [WY]) and throughout WY 2003, 2004, and 2005. The background turbidity levels (between storm events) were generally under 15 NTU and often less than 10 NTU. Short duration peaks exceeded 100 NTU (and a few exceeded 500 NTU) in all years, but the season when peak values occurred was not consistent, ranging from the onset of fall rains to snowmelt season and brief summer storms.

Because background turbidity levels on the Upper Truckee River is typically extremely low (i.e., less than 10 NTU), especially during summer construction season, very small changes from the natural state (an increase of <1 NTU) could result in a violation of the Basin Plan standard. Water with turbidity less than 10 NTU, and especially less than 5 NTU, generally appears clear to the naked eye, so detection of a potential violation in this range can only be determined with sensitive instrumentation that is appropriately deployed, calibrated, and maintained (USGS 2005: TBY-47). Additionally, the Basin Plan provides no narrative or numeric distinction regarding the season or duration of a turbidity increase to be considered detrimental, so an increase more than 10 percent over natural, of any duration could be considered a violation of the standard as written in the Basin Plan. Regardless of flow or season, a turbidity violation that lasts after an initial disturbance ends and/or impacts that produce a recurring or chronic source of turbidity exceeding this standard would be considered a significant adverse impact for purposes of this document.

Potential violations of the narrative turbidity standard at the low end of the NTU range, while considered a significant impact for CEQA/NEPA/TRPA analysis (as stated above), would not necessarily correspond to an adverse effect on beneficial uses. For example, an effect on aesthetic values under Non-Contact Recreation Use designation in the Basin Plan (Lahontan RWQCB 1995:2-2) is considered by Lahontan RWQCB to be the first indicator (i.e., most sensitive indicator) of an effect on beneficial uses (Kemper, pers. comm., 2010). If persistent visible turbidity from the project site occurred, particularly during the summer recreation period when flows are low, recreation use is high, and background conditions would exhibit low turbidity (i.e., good background clarity), it would potentially impair non-contact recreation beneficial uses. However, the turbidity values that would correlate with this impairment of aesthetics-related beneficial use might not occur unless turbidity was increased beyond natural seasonal background by several orders of magnitude (i.e., well beyond the <10 percent increase limit in the turbidity standard of the Basin Plan). Summer turbidity levels would also likely need to exceed the minimum aesthetic criterion to have adverse effects on other beneficial uses, including those supporting aquatic organisms. While impairment of beneficial uses would likely require the proposed project to elevate turbidity levels considerably further than 10 percent above background for a larger magnitude and longer duration beyond the more stringent limited area and brief period used as a significance threshold for this EIR/EIS/EIS, because of the CEQA checklist question regarding violation of “any water quality standard.”

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.4-1 (Alt.1)

Stream Channel Erosion within the Study Area. *Implementing Alternative 1 would not make direct changes to the channel of the Upper Truckee River, Angora Creek, or the unnamed creek and other drainages. However, natural geomorphic response to historic disturbances and the continuing effects of undersized bridges would cause channel instability that erodes the streambanks and streambed within the study area, releasing sediment and nutrients that degrade the river and lake water quality relative to undisturbed natural conditions. While implementing Alternative 1 would allow the adverse conditions to persist, it would not be a change from existing conditions. Therefore, this impact would be less than* ***less than significant****.*

Alternative 1 does not involve modifying the existing impervious surfaces or making changes to the channel that would result in a substantial increase in runoff volumes or peak flows. (See Impacts 3.3-1 [Alt. 1] and 3.3-2 [Alt. 1.] in Section 3.3, “Hydrology and Flooding.”) Therefore, implementing Alternative 1 would not directly increase driving forces causing stream channel erosion.

Implementing Alternative 1 would not directly modify the existing streambank stabilization treatments, but bank repairs would be implemented in response to flood events on an as-needed basis to protect infrastructure, natural resources, or private property. There would likely be continued streambank erosion along unprotected banks and streambed incision as active knickpoints continue migrating upstream for several decades as the stream makes natural geomorphic adjustments toward an equilibrium state.

Alternative 1 would not involve replacing or relocating the existing golf course bridges, except in the event they are damaged by a flood or are expected to fail. These undersized bridges, including the bridges by holes 6 and 7 (approximate RS 8200 and RS 7575), would continue to constrict flow during high flows, resulting in local streambed and streambank erosion.

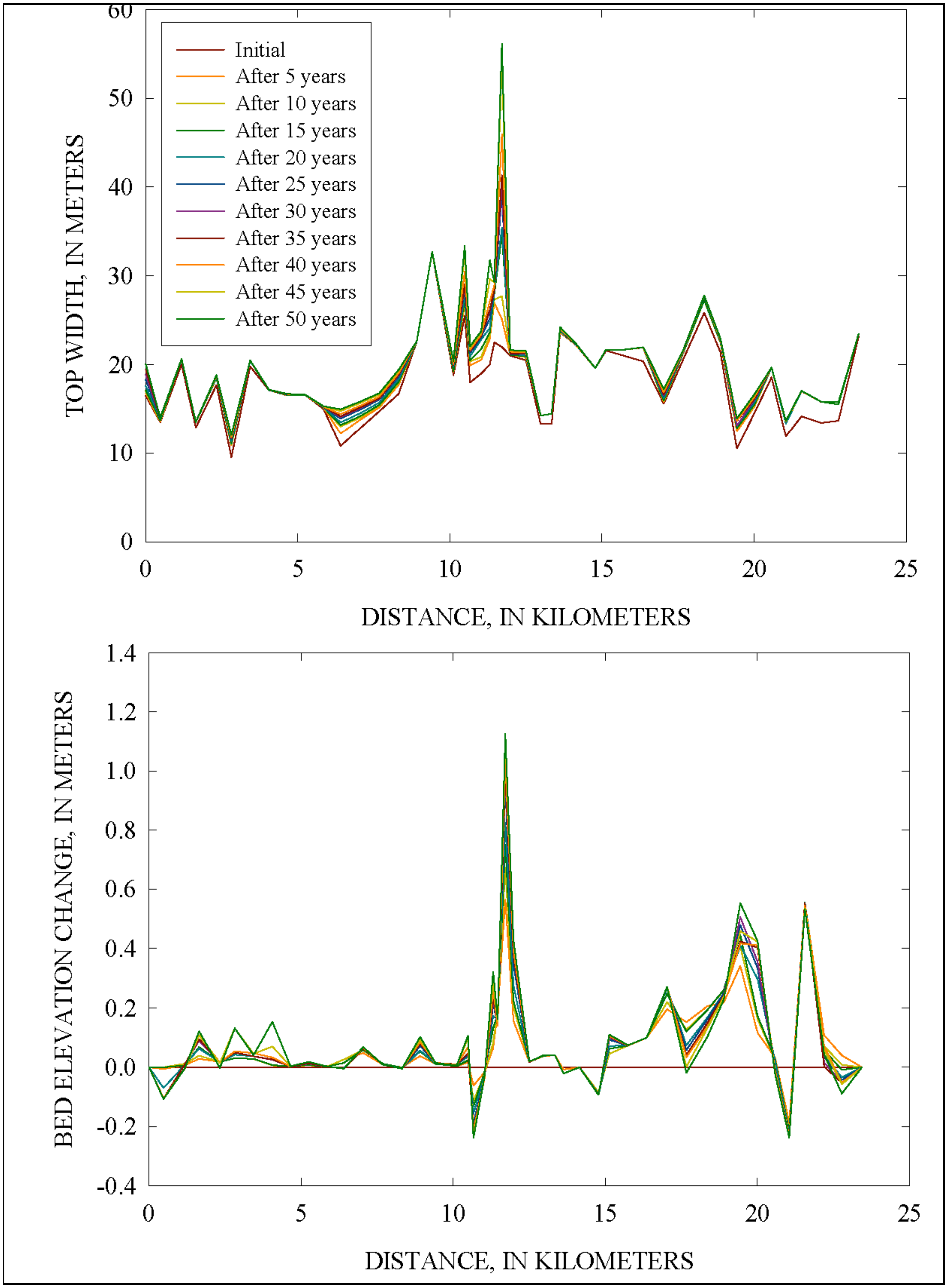
Alternative 1 would not involve making direct modifications to the channel of the Upper Truckee River, Angora Creek, or the unnamed creek(s) within the study area. However, the channels within the study area would continue their natural responses to past disturbances, the influence of ongoing land uses that affect hydrology and drainage, and the adverse hydraulic effects of existing undersized golf course bridges (SH&G 2004c). Therefore, implementing Alternative 1 would not decrease the channel erosion rates along the Upper Truckee River within the study area. Streambed and streambank erosion would continue at an accelerated rate in response to historic disturbances until the channel reaches equilibrium many years in the future. Implementing Alternative 1 would also perpetuate potential channel instability and future erosion within the lower reaches of Angora Creek and the unnamed creek.

The Upper Truckee River channel has undergone accelerated erosion in response to watershed-wide and site-specific past land use actions. The direct actions and the geomorphic response to those actions have created increased rates of streambed and streambank erosion. Some localized and watershed scale past actions, such as logging and log transport using stream channels and ditches or water supply diversions and ditches, had direct effects on channels within the study area. These actions typically decreased stream length and increased slope, channel depths, and/or bank heights. As a result, erosion occurred at the time of or subsequent to each disturbance, generating total sediment and fine sediment loads at rates that exceed natural conditions.

Within the study area, various types of streambank protection measures were installed in several locations over the past 40 years to limit erosion, but the measures addressed only local issues and did not include streambed protection, so their effectiveness and life spans were limited. Studies for the Lake Tahoe TMDL have documented the existing degraded condition of the river from field observations (Simon et al. 2003), and performed calculations that demonstrated it is largest contributor of fine sediment from streambanks to Lake Tahoe (Simon 2006, California Water Boards and NDEP 2007). A coupled watershed (AnnAGNPS) and channel (CONCEPTS) 50-year model simulation using flows based on historic conditions (Simon et al. 2003) predicted channel adjustments, over half of which would occur in the first 23 years. The channel change would be dominated by widening throughout the system, including the downstream half of the study area (10.8 to 14.8 km) (Exhibit 3.4-9a). Bed elevation changes would be more varied, with minor bed lowering, as well as net aggradation in the study reaches (Exhibit 3.4-9b).

Compilation of the TMDL streambank erosion results (California Water Boards and NDEP 2007:211–215) for specific subreaches of the Upper Truckee River allows a quantitative estimate of stream channel erosion in the study area and in other reaches. Using the existing conditions analyzed for the TMDL, the estimated fine sediment loads from streambank erosion in the study area under Alternative 1 would be 1,228 cubic yards (Table 3.4-10). The study area channel erosion rate per unit stream length of 145.16 cubic yards per 1,000 feet is higher than that for upstream or downstream reaches and nearly three times the rate for the river overall (54.4 cubic yards per 1,000 feet). These data indicate that the degraded existing conditions would persist under the No Project/No Action Alternative.

No quantitative estimate of streambank erosion loads or load reduction potential along Angora Creek or the unnamed creek within the study area was made in studies for the TMDL (California Water Boards and NDEP 2007). Alternative 1 would not involve making any direct changes to either stream, but natural adjustment to past disturbance and response of the tributaries to changes within the main stem of the Upper Truckee River at the tributary mouths would occur. Based on geomorphic principles and qualitative analysis, both tributaries may undergo streambed erosion near their mouths, and they may be destabilized by widening of the Upper Truckee River that would effectively "shorten" and steepen the tributaries.



The study area is located between 10.8 and 14.8 km distance (upstream of the mouth at Lake Tahoe).
Source: Simon et al. 2003

Simulated Changes in Bank Top-Width and Bed Elevation of the Upper Truckee River Over a 50-Year Period

Exhibit 3.4-9a and b

Table 3.4-10 Estimated Stream Channel Bank Erosion of Fine Sediment on the Upper Truckee River under the No Project/No Action Alternative			
River Reach	Distance Upstream of Lake (feet)	Bank Erosion of Fine Sediment[1] Alternative 1 (No Project/No Action)	
		(cubic yards)	(cubic yards per 1,000 feet)
Downstream reaches	0–40,000	2,451	61
Study area reaches	40,000–48,458	1,228	145.2
Upstream reaches	48,458–79,364	641	20.7
Total	**79,364**	**4,320**	**54.4**

Note:
[1] Fine sediment is less than 0.063 millimeter in diameter.
Source: California Water Boards and NDEP 2007

Future channel erosion under the No Project/No Action Alternative, although generally expected to follow a predictable trend based on geomorphic channel evolution models as described above, could be altered by climate change. Climate change may modify future hydrology and sediment loads from the watershed but was not specifically represented in the TMDL modeling, which assumed future hydrology to be similar to the historic record. Increased rainfall as a proportion of total precipitation, increased runoff during winter, decreased snow water equivalent, and decreased spring/summer runoff are conditions that could result from climate change and limit the rate of natural recovery within the incised channel system. There could also be offsetting effects of climate change on stream channel erosion. For example, vegetation encroachment within channels related to lower average annual flows may help stabilize some of the existing streambanks. However, the potential for severe rain or rain-on-snow floods may remain the same or even increase.

Under Alternative 1, no change to the adverse existing conditions would be made, and channel erosion rates would continue to exceed natural background. While this is an adverse condition that would continue, because it is not a change from existing conditions, this impact would be less than significant.

No mitigation is required.

IMPACT 3.4-2 (Alt.1) **Risk of Channel Erosion Damage to Sewer Pipelines.** *Implementing Alternative 1 would not improve or enhance existing protective cover of sewer pipelines crossing the Upper Truckee River or within 25 feet of the existing banks, and it would not involve taking measures to stabilize the channel to reduce future streambed or streambank erosion. Natural geomorphic adjustments to past disturbances and continuing hydraulic constrictions at bridges will increase the risk of damage to pipelines that could potentially release untreated wastewater to the river and eventually reach Lake Tahoe. Implementing Alternative 1 would allow this adverse condition to persist. This impact would be* **less than significant***.*

The existing sewer pipeline crosses Angora Creek within the study area. This crossing depth is unknown however, is currently not exposed in the stream channel. The pipeline crossing under the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, and the upstream crossing at RS 8800 is an exposed concrete encasement. These crossings are inspected by STPUD twice per year (Adams, pers. comm., 2009). Continued normal channel dynamics, particularly any additional channel bed erosion in the future, may further diminish the remaining protective cover at RS 1400 or potentially undercut the concrete casing at RS 8800, increasing the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Additionally, a few hundred feet of sewer pipeline is located parallel to and within 25 feet of the eroding streambank on the Upper Truckee River between RS 6500 and RS 5900. Continued normal channel dynamics, particularly any additional channel widening in the future, may undermine and/or expose this section of the sewer pipeline and increase the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Under Alternative 1, no change to the adverse existing conditions would be made; therefore, the risk of damage to the sewer pipelines would continue and would not be a direct effect of State Parks' implementation of Alternative 1. As occurs under existing conditions, STPUD would continue to monitor the sewer crossings and, if deemed necessary, would make an assessment of risk of damage and implement grade control measures to protect the sewer line. These protection measures are under the authority of STPUD. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-3 (Alt.1)	Long-Term Increased Surface/Soil Erosion within the Study Area. *Alternative 1 would not involve modifying the topography, soils, vegetation, or drainage in the areas of existing surface erosion caused by prior surface disturbances within Washoe Meadows SP. Implementing Alternative 1 would allow existing areas of active erosion to persist. This impact would be* ***less than significant****.*

Alternative 1 would not directly modify the existing disturbed former quarry, unpaved access roads, informal trails, or other disturbed surfaces that have accelerated soil erosion within the Washoe Meadows SP portion of the study area (see Impact 3.6-1 (Alt. 1) in Section 3.6, "Earth Resources"). No changes to the drainage or vegetation that might affect soil erosion rates would be expected. Alternative 1 would not involve changes to the adverse existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-4 (Alt.1)	Fine Sediment and Nutrient Retention within the Study Area. *Alternative 1 would not involve directly modifying the channel capacity, elevation, frequency of overbanking, or area of functional active floodplain, although future natural geomorphic adjustments to historic disturbances would be expected to eventually form a small inset floodplain below the terrace banks. Implementing Alternative 1 would allow the impaired fine sediment and nutrient retention conditions to persist. This impact would be* ***less than significant****.*

Under the No Project/No Action Alternative, the Upper Truckee River, Angora Creek, the unnamed creek, and the existing 36-acre active floodplain in the study area would not be directly modified. The channel capacity would remain oversized, the streambed elevation would remain low, and streambanks would remain high, all of which limit normal frequent flows (i.e., the 2-year peak flow) from overbanking onto the surrounding former floodplain (now a terrace). The estimated location and area of the active floodplain would remain similar to existing conditions (see Exhibit 3.3-14).

Natural geomorphic adjustments along the Upper Truckee River would continue and would further enlarge the channel and worsen the existing degraded floodplain connectivity to surrounding terrace surfaces over time. The active floodplain area and potential for frequent overbanking in the study area would be either similar to existing conditions or potentially worse if climate change reduces available streamflow. These factors would reduce the frequency, area, and duration of floodplain inundation. Some reaches could have small increases in active floodplain area where channel widening has progressed to the point of creating an inset floodplain between the high-terrace banks where additional bank treatments were not implemented to protect golf course infrastructure. However, net sediment and nutrient retention would not necessarily be improved substantially because these inset floodplain surfaces would be more vulnerable to disturbance during high flows than would active floodplains on the broader surrounding terrace. Therefore, the opportunity for floodplain processes to provide water quality treatment would be further degraded in the study area under the No Project/No Action Alternative.

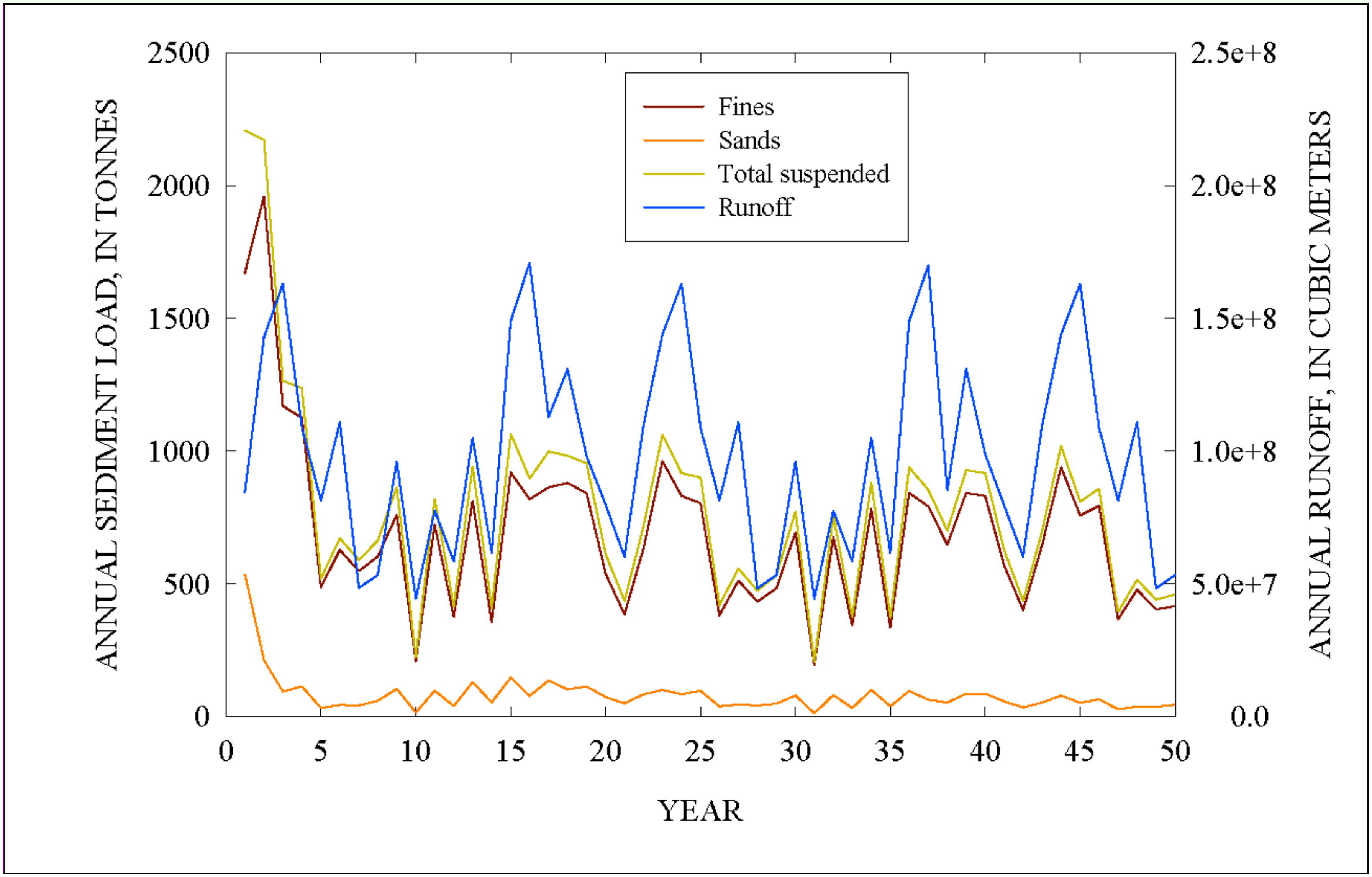
Under Alternative 1, no change would be made to the adverse existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-5 (Alt.1)	**Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Alternative 1 would not involve directly modifying the channel bed profile, bank and bed materials, or hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Naturally declining post-watershed disturbance coarse sediment yield would continue, along with adverse effects on downstream channel erosion and beach erosion adjacent to the river mouth (e.g., Cove East and Barton Beach). In the long term, climate change effects could either exacerbate or counteract present trends. Because conditions could range from worse than the existing degraded condition to a possible improvement, any determination regarding climate change effects on coarse sediment transport and delivery downstream remains* ***too speculative for a meaningful significance conclusion****.*

Historic disturbances in the watershed would have caused temporary episodes of increased erosion and sediment production, affecting coarse sediment transport through the river and delivery to Lake Tahoe. The magnitude and timing of such historic sedimentation episodes has not been reconstructed in detail. Although past direct actions throughout the watershed caused increased sedimentation episodes the overall trend since the end of Comstock Era logging has been a decrease in coarse sediment loads. Additionally, human management of the lake level and effects of dredging and development at the river mouth have also contributed to increased beach erosion of the Cove East and Barton Beaches. At the watershed scale, past actions, such as late 1800s logging, channel straightening, and mid-1900s urban development, temporarily increased total sediment transport in the river, prompting various possible stream adjustments (incision, widening, aggradation, braiding, avulsion) and increasing the amount of coarse sediment that reaches the lake and supplies local beaches. Over the last few decades, coarse sediment carried by the Upper Truckee River and Trout Creek has been insufficient to maintain the historic beach deposit length, width, or thickness. In addition, wave energy effects on all Lake Tahoe beaches have increased since the late 1800s through management of the lake to hold water in storage and keep the lake at a high elevation when possible. Since the 1950s, beach sediment supply has also been decreased by initial and maintenance dredging of the Tahoe Keys navigation channels west of the Upper Truckee River. These past actions have resulted in considerable and continued shoreline retreat at the Upper Truckee Marsh. Historic beach erosion has primarily affected active, largely unvegetated sand deposits but also has disturbed locations with dense herbaceous vegetation and mature conifers rooted in soils along the beach ridge.

Under the No Project/No Action Alternative, the amount of coarse sediment delivered from the study area to downstream reaches and the local beaches would change as the watershed and stream channels continue to respond to past disturbances, ongoing management, and the influences of climate change. No quantitative projections of the net effects of all these factors on future coarse sediment delivery have been made. The results of analysis of suspended sediment data over the periods of record for USGS gage sites throughout the Lake Tahoe Basin indicated that the Upper Truckee River at the project site (Gage 10336610) is one of the sites with a statistically significant decreasing trend in mean daily sediment transport rate (Simon et al. 2003). Recent historic relatively low coarse sediment yields from the watersheds are estimated to continue and even have declining sand or coarser loads as channels widen and the streambed stabilizes (with net deposition in certain reaches) (Exhibit 3.4-10). It is possible that rainfall runoff flood processes could result in periodic increases in coarse sediment loads, even if most years have reduced coarse sediment transport compared to present.



Source: Simon et al. 2003

Simulated Annual Runoff and Loads of Fines, Sands, and Total Suspended Sediments Delivered to the Lake for the 50-Year Period

Exhibit 3.4-10

The effect of reduced coarse sediment transport within the Upper Truckee River could include changes in channel erosion, and reduced coarse sediment delivery to the beaches would worsen historic trends of shoreline retreat. However, the net long-term effect of the above factors on future channel and beach erosion is highly uncertain and difficult to predict, especially giving the distance from the study area to the beaches. There could be a continuing adverse trend of net coarse sediment deficit and increasing risk of channel or beach erosion, which would be similar to and worse than the existing degraded condition. However, it is also possible that climate change could result in vegetation encroachment within the incised river channel system that stabilizes the bed or banks, and lowered lake levels could reduce potential wave energy along the existing beach ridge. The net effect of these factors has not been quantified and has high uncertainty, and could range from worse than the existing degraded condition to a possible improvement.

Implementing Alternative 1 would not make any change to existing conditions, and after thorough investigation, the outcome on coarse sediment transport and delivery downstream remains too speculative for a significance conclusion, because depending on which predictions for climate change influences occur, they could either exacerbate or improve conditions.

No mitigation is required.

IMPACT 3.4-6 (Alt.1)	**Short-Term Risk of Surface Water or Groundwater Degradation during Construction.** *Alternative 1 would not involve implementing any planned major or prolonged construction activities along or in the channel of the Upper Truckee River, Angora Creek, or the unnamed creek, although repairs to bridges, existing streambank protections for the golf course, or infrastructure could be required if damage or threats of failure occurred, which is the same as with current practices. Although temporary BMPs would be implemented, short-term risks of water quality degradation during construction could occur, particularly if emergency repairs must be conducted during high-flow events. However, the extent of repairs would be local, the background turbidity would be elevated during a flood event, and the seasonal timing would lesson potential impairment of noncontact recreation beneficial uses (aesthetics) or other uses. While adverse, temporary turbidity conditions could occur with emergency repairs, the potential need for repairs and risk of turbidity are the same as existing conditions, so there is no change resulting from Alternative 1; therefore, this impact would be* ***less than significant****.*

Alternative 1 would not include any planned construction, although it is possible that emergency repairs during or following damaging high flows could be required to reinforce or replace bridges, repair streambank stabilization, or protect infrastructure (i.e., irrigation pipelines on bridges or buried under or along the river), as under existing conditions. The exact nature and extent of potential construction under Alternative 1 are unknown and could range from minor activities conducted quickly and without the need to divert or bypass active streamflow to major bridge repairs or replacement activities. The probability of such construction is uncertain but reasonably foreseeable over the life of the project. Emergency response during high-flow events could be required because the existing bridges are undersized and are vulnerable to high flows and/or debris that could be entrained in high flows.

If a bridge or infrastructure failure occurs during high flows, emergency response activities could be needed without extensive planning but would be expected to incorporate temporary BMPs. BMPs implemented during high-flow events would be less effective than BMPs planned and implemented to address potential water quality risks during a normal low-flow construction season. Possible construction activities under Alternative 1 could include planned summer season construction follow-up to damaging high flows or emergency response during high-flow events. Temporary BMPs for planned summer season follow-up repairs would be designed, sized, and implemented with planning and regulatory oversight and would be expected to be effective at preventing temporary water quality degradation, particularly because the efforts would be localized sites by bridges or infrastructure. It is possible that temporary BMPs for emergency response during high-flow events would not be effective at preventing short-term turbidity violations. In a flood flow situation, the background turbidity would be elevated, but the ability to isolate even a small work area for the repair work could be limited by high flows.

Therefore, disturbance from construction could elevate turbidity in the active flow of the channel more than 10 percent above background, at least briefly.

This risk of an adverse condition would be the same as under existing conditions, where current practice is to repair or protect infrastructure as needed, so the risk of a violation of the turbidity standard or other water quality standard is the same currently as it would be with implementation of Alternative 1. Historic data documenting whether short-term violations of water quality standards resulted during past emergency response efforts to stabilize the streambed or streambanks is not available. However, State Parks uses current BMP practices to protect water quality during any construction implementation within the study area. Given the strictness of the standards and the conditions present during such response/repair efforts, it is likely that short-term violations of water quality standards have occurred under the existing baseline conditions howver, likely to a limited magnitude a duration that would not affect beneficial uses. The potential effects under Alternative 1 would be similar to and no worse than the historic adverse condition. To be deemed a significant environmental impact, a "substantial or potentially substantial adverse change" must result from the alternative (see State CEQA Guidelines Section 15382, definition of a significant effect on the environment). Because no change from existing conditions would occur, the continuation of the existing risk of an adverse condition would not be considered a significant impact for this analysis. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.4-7 (Alt.1) **Short-Term Risk of Surface Water or Groundwater Degradation Following Construction.** *Implementing Alternative 1 would not require major or prolonged construction activities, it would not require a period of channel adjustments following construction to meet final design, and any construction would be stable at the time of installation. Therefore, implementing Alternative 1 would not make any changes to the existing condition that could increase short-term risk of water quality degradation following construction. This impact would be* ***less than significant****.*

Implementing Alternative 1 would not require any planned construction, although it is possible that flood damage to existing undersized bridges, public infrastructure, or stream stabilization features that protect infrastructure may need emergency or follow-up repairs, as under existing conditions (see Impact 3.4-6). If such activities are required to protect infrastructure and/or repair or replace bridges, their areal extent would be localized, and it is likely that the repair measures would feature hard engineering features designed to meet final dimensions and resistance at the time of installation and to remain stable (in order to protect infrastructure). A possible risk of short-term water quality degradation within the first few years after construction could arise from two potential mechanisms:

- expected natural channel adjustments in accordance with repair design and/or
- a large flood event (e.g., 25-year recurrence or greater) in the first few years (approximately 5) after construction.

A natural channel adjustment effect or large flood effect would not be expected under Alternative 1 because methods that achieve immediate stability likely would be used at the time of construction. It is unlikely that post construction geomorphic adjustments would be required to meet final design, and the treatments would cover the entire potential erosion source area. Implementing Alternative 1 would not create a mechanism to increase short-term risk of water quality following construction. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-8 (Alt.1)

Risks of Surface Water and Groundwater Contamination from Golf Course Operations. *Alternative 1 would not involve modifying the footprint area, configuration, or landscaping management of the existing golf course. Risks of surface water and groundwater contamination would remain similar to those under existing conditions, and operations would continue to be subject to water quality protection regulations, with monitoring, reporting, and response requirements under direct oversight of the Lahontan RWQCB. This impact would be* ***less than significant****.*

Alternative 1 would not involve modifying the physical layout or management practices of the existing landscaped golf course. The managed golf course landscaping would still occupy 123 acres of SEZ and be adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek without any substantial buffer (i.e., minimally managed or natural landscape) for much of the study area. Paved golf course paths and poor drainage in several portions of the course (e.g., holes 1, 3, 5, 8, 9, 10, 11, and 13) would continue to provide routes for potential contaminants to accumulate and enter the surface water and groundwater system. Potential discharges from operations, including use of chemicals and activities posing erosion risk, would continue to be regulated by the Lahontan RWQCB (presently under Board Order No. 6-00-48). Although risks from accidental spills or normal operations would still occur, they would be of similar magnitude and potential frequency as under existing conditions. Past monitoring and reporting indicate that substantial, long-duration, or repeated water quality violations have not occurred during historic golf course operations. Alternative 1 would not involve modifying the existing adverse risk posed by the golf course layout and operations. This impact would be less than significant.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.4-1 (Alt.2)

Stream Channel Erosion within the Study Area. *Alternative 2 would involve making direct changes to the channel of the Upper Truckee River and the mouths of Angora Creek and the unnamed creek. The changes would offset past geomorphic response to historic disturbances and the undersized bridges within the study area by lengthening the channel, reactivating and constructing more appropriately sized channel sections, improving floodplain connectivity, and removing bridges. These modifications would prompt improved stream function and reduce overall erosion of the streambed and banks. This would be a substantial long-term benefit overall, but localized erosion could increase at the bridge removal sites, downstream of the treated reaches, and/or in the two tributary creeks. This localized risk of increased erosion would be* ***potentially significant****.*

Alternative 2 would involve modifying the existing impervious surfaces by changing the location and total area of impervious surfaces but would include drainage improvements, wider buffers distances to the river, and mitigation measures to limit potential increases in runoff volumes or peak flows. (See Impacts 3.3-1 [Alt. 2] and 3.3-2 [Alt. 2] in Section 3.3, "Hydrology and Flooding.") Therefore, implementing Alternative 2 would not directly increase driving forces causing stream channel erosion.

Alternative 2 would involve replacing and/or repairing existing streambank stabilization treatments in locations of the existing channel that will remain part of the active main channel. Existing streambed knickpoints would be addressed by lengthening the channel (reducing slope), placing hard grade controls (anchored high-gradient riffles) at the upstream and downstream project boundaries, and installing armored riffles at intervals within the reach to maintain the proposed streambed elevation.

Compilation of the TMDL streambank erosion results (California Water Boards and NDEP 2007:211–215) for specific subreaches of the Upper Truckee River allows a quantitative estimate of the effect of the proposed alternatives on stream channel erosion. Although the specific measures proposed under Alternative 2 were not modeled for the TMDL, they can be represented by using the "restoration" and "mixed treatment" tiers results for the treatment subreaches within the study area. The estimated fine sediment loads from streambank erosion in the study area would be793 cubic yards, which represents a 35.4-percent reduction for the study area and a 10.8-

percent reduction for the entire river relative to the No Project/No Action Alternative (Table 3.4-11). This estimate would represent the long-term fully functional condition after geomorphic adjustments to the construction activities, which would be a substantial beneficial effect relative to existing conditions and Alternative 1, the No Project/No Action Alternative.

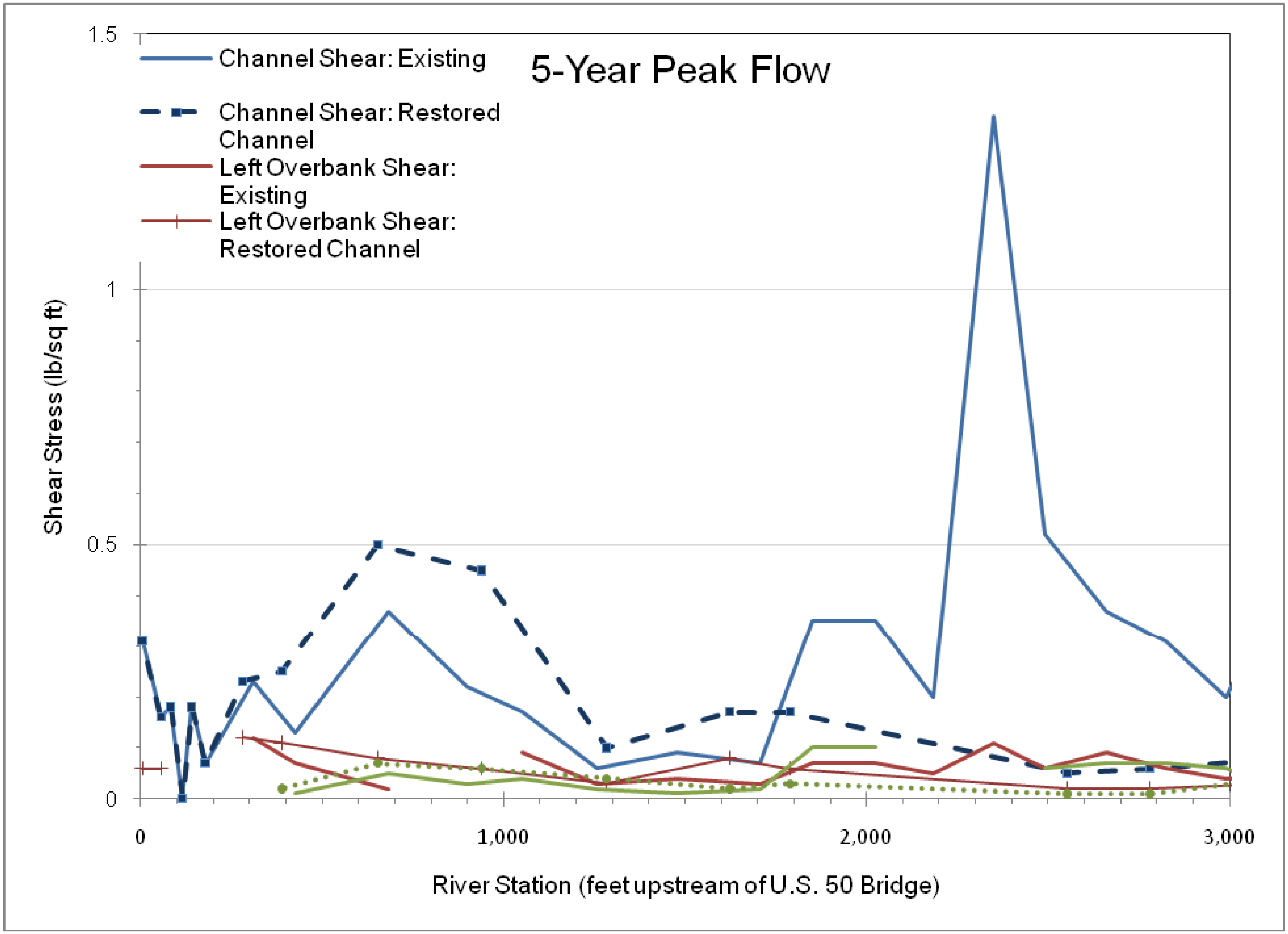
Table 3.4-11
Estimated Stream Channel Bank Erosion of Fine Sediment on the Upper Truckee River under Alternatives 2, 3, and 5

River Reach	Distance Upstream of Lake (feet)	Bank Erosion of Fine Sediment[1]	
		Alternative 1 (No Project/No Action) (cubic yards)	Alternatives 2, 3, 5 (cubic yards)
Downstream reaches	0–40,000	2,451	2,451
Study area reach	40,000–48,458	1,228	793
Upstream reaches	48,458–79,364	641	2,451
Total	**79,364**	**4,320**	**3,885**

Note:
[1] Fine sediment is less than 0.063 millimeter in diameter.
Source: California Water Boards and NDEP 2007 (compiled for these subreaches in Appendix F)

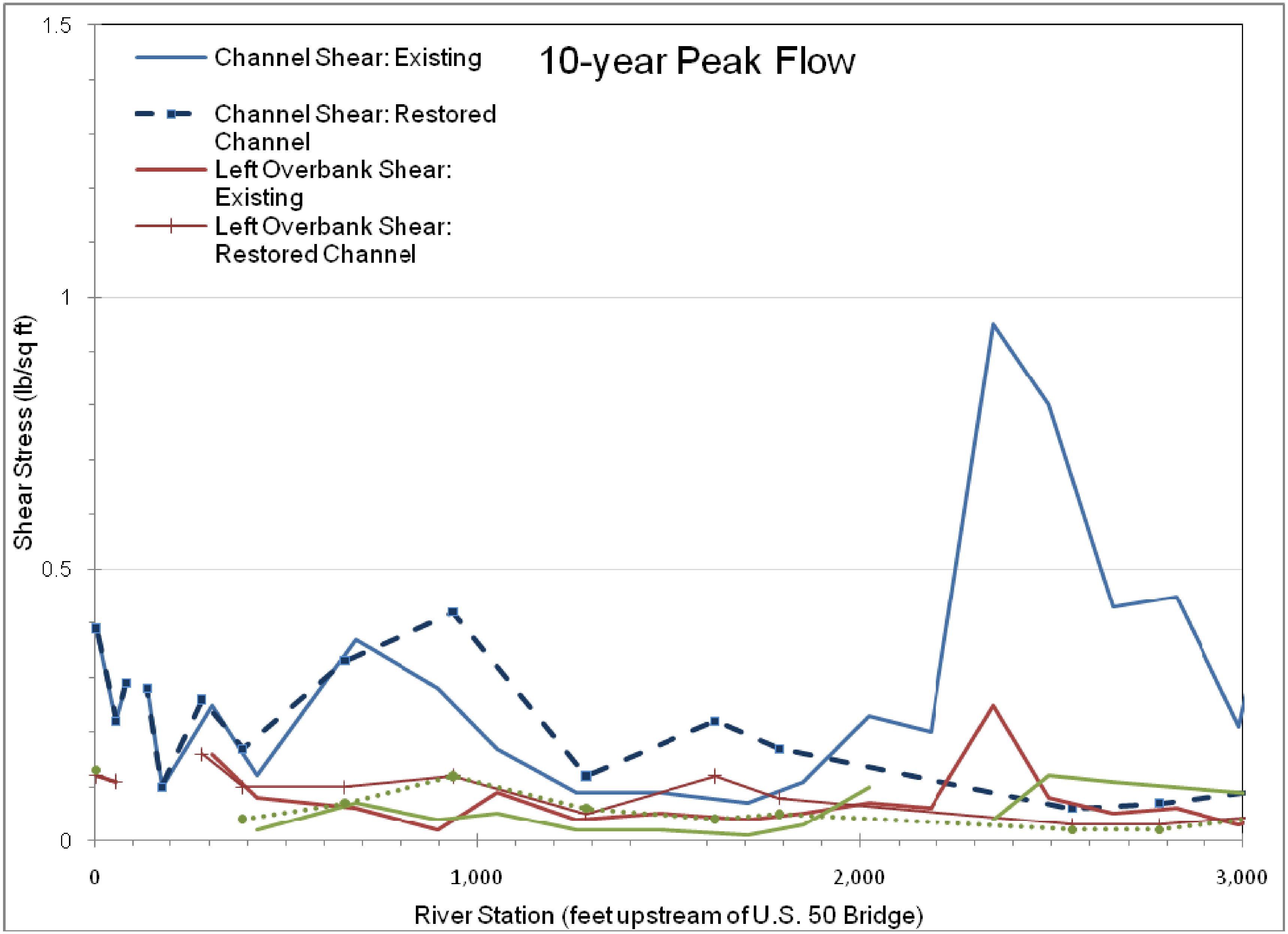
Under Alternative 2, the streambed elevation and water surface elevations would be raised over the full range of streamflow events (e.g., 5-year, 10-year) (see Exhibit 3.3-13 in the Section 3.3, "Hydrology and Flooding") within the treated reaches (RS 1400 to RS 8800), creating improved overbank connections with the surrounding land surface throughout the treated reaches. However, downstream of the proposed treatments, the water surface would have a steepened transition back to the existing untreated areas downstream of RS 1400. The hydraulic modeling results confirm qualitative assumptions that the U.S. 50 bridge effectively controls the water surfaces and velocities at the downstream study area boundary because the existing and proposed shear stress would not change at the bridge itself. However, hydraulic modeling results (SH&G 2004b) suggest that shear stress within the channel and on the left and right overbank areas could increase relative to existing conditions in the reach downstream of RS 2000 (Exhibits 3.4-11A, 3.4-11B, and 3.4-11C). The relative change and absolute magnitude of the average shear stress increases are not large but may have a geomorphic effect. Mobilization of larger gravels in the streambed could be increased for the 5- and 10-year flows, particularly between RS 700 and RS 1200. A minor increase in the risk of erosion to poorly vegetated or bare soils in the overbank area could result in a few areas.

Because the hydraulic modeling was performed for the conceptual design, the potential effect of the eventual design could be less than the estimates presented here, but the possible impact mechanism of a raised upstream water surface would exist and would need to be considered. An additional related impact mechanism would be an increase in return flow depths and/or velocities as floodplain runoff reenters the reincorporated incised existing channel across high streambanks, potentially causing a localized increased risk of erosion. The potential area of these erosion risks are small relative to the thousands of feet of project-related benefits of reduced erosion throughout the treated subreaches under Alternative 2 (as revealed by the reduced fine sediment load estimates for the entire study area presented in Table 3.4-11, above); however, a locally adverse effect may occur within the study area. Therefore, it is possible that localized erosion could be worsened relative to existing conditions and the No Project/No Action Alternative.



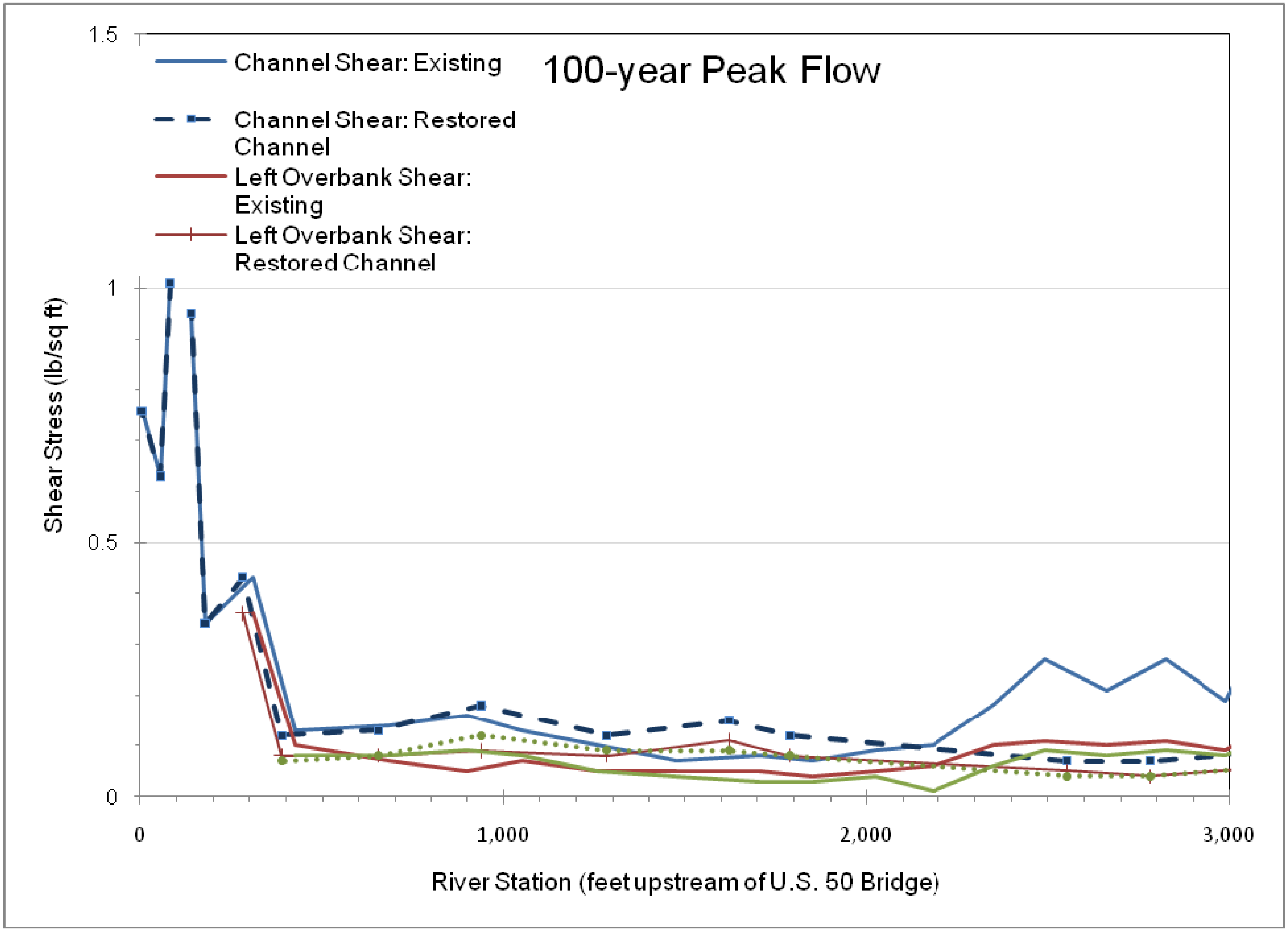
Source: HEC-RAS model output by SH&G, October 2004

Estimated Shear Stress at Downstream End of Study Area: 5-Year Peak Flow **Exhibit 3.4-11A**



Source: HEC-RAS model output by SH&G, October 2004

Estimated Shear Stress at Downstream End of Study Area: 10-Year Peak Flow **Exhibit 3.4-11B**



Source: HEC-RAS model output by SH&G, October 2004

Estimated Shear Stress at Downstream End of Study Area: 100-Year Peak Flow **Exhibit 3.4-11C**

Under Alternative 2, the mouths of Angora Creek and the unnamed creek would be relocated to meet the modified alignment of the Upper Truckee River, and the bed elevation of the confluence would be raised to match the proposed streambed elevation of the river. These changes could shorten the creeks and may result in steepening of their lower reaches, depending on the final bed elevation at their mouths. If steepening results, shear stress within the two creeks could increase and result in channel erosion and/or initiate headcutting that might propagate upstream. Erosion within the lower reach of Angora Creek could destabilize or damage the existing sewer pipelines and potentially risk release of contaminated water into the creek and the Upper Truckee River. Alternative 2 includes streambed and streambank protection measures in the modified lower reaches of each creek, although specific design and performance standards have not been determined as part of conceptual design. Therefore, it is possible that localized erosion could be worsened relative to existing conditions and Alternative 1, the No Project/No Action Alternative.

Alternative 2 would involve replacing all the existing golf course bridges with a single, longer span bridge between RS 6600 and RS 6900 (Subreach 3A). The new bridge would span the channel and active floodplain and would not require placing piers in the channel bed; therefore, it is not expected to constrict flows or increase flow velocity in the vicinity. In addition, local streambed and streambank protection measures would be installed at the new bridge. The existing streambed scour and streambank erosion at each of the existing undersized bridges, especially the bridges upstream of holes 6 and 7 (approximately RS 8200 and RS 7575), would be eliminated. Removal of the five undersized bridges would eliminate the existing high-flow constrictions and modify local hydraulics. Removal of bridges would slow the velocity at and just downstream of each bridge crossing and speed up velocities just upstream of each crossing relative to existing conditions. This change in local hydraulics could, if not addressed by sufficient bed and bank stabilization measures, result in increased shear forces sufficient to increase bed and bank erosion upstream of each former bridge location. Alternative 2 includes implementation of streambed and streambank protection measures in the vicinity of each removed bridge, but the performance standards for those measures have not been specified. Therefore, it is possible that localized erosion could be worsened relative to existing conditions and the No Project/No Action Alternative.

Although the overall long-term channel erosion effects for the treated reaches of the Upper Truckee River under Alternative 2 would be beneficial compared to existing conditions and the No Project/No Action Alternative, some portions of the study area could experience increased channel erosion. This localized impact would be potentially significant.

Mitigation Measure 3.4-1A (Alt. 2): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

Final design will include specific streambed stabilization and streambank protection measures at each proposed bridge removal site (and the upstream and downstream directions) that will minimize future erosion under the modified hydraulic conditions, as verified by quantitative modeling that demonstrates stability up to the 20-year peak event. The measures may include grading to modify the channel dimensions (e.g., eliminate existing large scour pool) and the shape of the channel bed and banks, along with installation of rock and/or biologic materials.

Mitigation Measure 3.4-1B (Alt. 2): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

Final plans will include design features or specific streambed stabilization and streambank protection measures in the transition zone downstream of the treated reaches (approximately RS 150 to RS 1400), if detailed hydraulic modeling of the 5-year, 10-year, and 100-year peak flows indicates that shear stress changes would increase streambed mobility/erosion, streambank erosion, or overbank erosion in the floodplain.

Mitigation Measure 3.4-1C (Alt. 2): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

Final design will include specific streambed stabilization and streambank protection measures in the lower reaches of Angora Creek and the unnamed creek, based on detailed hydraulic modeling of the proposed reconfiguration of their alignments and slopes, to protect against increased erosion up to the 20-year peak event or to a higher design standard as needed to protect the sewer pipeline crossings.

Implementation of these mitigation measures would reduce impacts associated with potential increases in localized channel erosion to a less-than-significant level because bed and bank stabilization measures would be installed immediately upstream and downstream of the bridge removal sites, downstream of the treated reaches, and in the lower reaches of the two tributary creeks.

IMPACT 3.4-2 (Alt.2)	Risk of Channel Erosion Damage to Sewer Pipelines. *Implementing Alternative 2 would improve existing protective cover over sewer pipelines crossing the Upper Truckee River, but the new alignment would place the channel within 25 feet of the buried pipeline in two locations. Natural geomorphic adjustments following construction may pose a risk of damage to these portions of the sewer pipelines, as well as the two Angora Creek crossings, potentially releasing untreated wastewater to the river and creek that would eventually reach Lake Tahoe. This impact would be* ***potentially significant****.*

The existing sewer pipeline crossing under the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, the upstream crossing at RS 8800 is an exposed concrete encasement, and the depth of the crossing along Angora Creek is currently not known, however is not exposed and is protected by sheetpile. All of these crossings are inspected by STPUD twice per year (Adams, pers. comm., 2009). Alternative 2 would involve installing hard grade control (anchored high-gradient riffle) that increases the thickness and resistance of the channel bed over these crossings and for some distances upstream and downstream, diminishing the risk of damaging effects during a major flood flow. This would be a beneficial effect relative to existing conditions and the No Project/No Action Alternative.

Under the proposed new channel alignment, the active channel would be located further away from a vulnerable section of pipeline near the existing bank between RS 6500 and RS 5900 but would be located near different sections of buried pipeline in two other locations. A couple hundred feet of the existing sewer pipeline would be parallel to and within 25 feet of the new streambank in each of two proposed reconnected meanders, upstream of existing RS 4100 and downstream of existing RS 7900. Normal channel dynamics following construction, particularly any channel widening in the future, may undermine and/or expose these sections of the sewer pipeline and increase the risk of damaging effects during a major flood flow. Under Alternative 2, bank stabilization measures, including potentially using buried sheetpile or launchable rip-rap between the pipeline and the river, relocating pipeline sections, adjusting other proposed streambank stabilization methods, and/or adjusting the location of the reconnected channel to increase the distance from the existing pipeline, would be implemented where needed, as long as the measures would be effective at preventing lateral channel migration (bank erosion) from reaching and/or undermining the existing buried pipeline. However, flood event design standards have not been established. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Changes at the mouth of Angora Creek could potentially modify the channel slope and erosive forces in the vicinity of two existing sewer crossings, particularly if streambed and streambank treatments within lower Angora Creek are not designed specifically to prevent potential headcutting that could erode the bed upstream and destabilize or threaten the existing pipelines.

Proposed construction activities related to golf course and floodplain modifications, including grading and excavation, could potentially damage the sewer lines that run through several areas within the project site. In addition, to effectively reach final grade, some of these lines could require relocation for project implementation. If the sewer pipeline were damaged or a spill were to occur during grading or relocation, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Under Alternative 2, the risk of damage to the sewer pipelines would be reduced along the river relative to the existing conditions and No Project/No Action Alternative for some locations, but increased in other portions of the study area. Furthermore, grading activities could potentially cause damage to pipelines, or a spill could occur. This impact would be potentially significant.

Mitigation Measure 3.4-2A (Alt. 2): Protect Vulnerable Portions of the Sewer Pipeline up to the 100-Year Flood Event.

In coordination with STPUD, State Parks will design and install protection measures for the buried sewer pipeline north and west of the proposed reconnected meanders on the Upper Truckee River upstream of existing RS 4100 and downstream of RS 7900 or work with STPUD to relocate the vulnerable section of pipeline. Final design will prevent channel adjustments up to the 100-year peak event in areas potentially at risk of exposing/undermining sewer pipelines. Final design schematics will be reviewed and approved by the Engineering Department of STPUD.

Mitigation Measure 3.4-2B (Alt. 2): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is similar to Mitigation Measure 3.13-2A. Before final design schematics are prepared, State Parks or its primary representative will consult with STPUD to determine the exact location of underground facilities in the project area, including the public right-of-way, and design the final grading plans to avoid existing utilities where possible. If these utilities cannot be avoided, State Parks will coordinate with STPUD to determine the best possible course of action to minimize potential disturbance.

Before the start of construction, utility locations will be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines will be clearly marked in the area of construction on the construction specifications in advance of any earthmoving activities. Before construction begins, State Parks will provide advance notification of any needed disturbance to area businesses and residents. STPUD consultation should continue during construction to ensure that facilities are avoided and protected and that service disruptions are minimized as construction proceeds.

Before the start of construction, a response plan will be prepared to address potential accidental damage to a utility line. The plan will identify chain-of-command rules for notifying authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations will be conducted by the contractor. The response plan will be implemented by State Parks and its contractors during construction activities.

Mitigation Measure 3.4-2C: Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-1C.

With implementation of Mitigation Measures 3.4-2A (Alt. 2) through 3.4-2C (Alt. 2) as described above, Impact 3.4-2 (Alt. 2), the potential increased risk of sewer pipeline damage and water quality degradation, would be less than significant because vulnerable portions of the sewer pipeline would be protected up to the 100-year flood event; utility locations would be verified, utility providers would be consulted, a response plan would be prepared and implemented, and worker training with respect to accidental utility damage would be conducted; and bed and bank stability in the lower reaches of the two tributary creeks would be ensured.

IMPACT 3.4-3 (Alt.2)	Long-Term Surface/Soil Erosion within the Study Area. *Alternative 2 would involve modifying the topography, soils, vegetation, and drainage to offset the existing erosion caused by prior surface disturbances within Washoe Meadows SP to restore natural conditions and would involve incorporating other areas of existing erosion into the reconfigured golf course, along with appropriate landscaping and/or permanent BMPs. This treatment of prior disturbed sites would be beneficial relative to existing conditions and the No Project/No Action Alternative. This effect would be* **beneficial**.

Alternative 2 would modify the existing disturbed former quarry and some of the unpaved access roads, informal trails, or other disturbed surfaces that have accelerated soil erosion within Washoe Meadows SP portion of the study area. As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land; however, additional development in the remaining park area would not occur because most of the park is within sensitive, low-capability lands. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

Under Alternative 2, the natural drainages would be considered and incorporated within planned stormwater drainage improvements for the reconfigured golf course, and areas of prior disturbance and soil erosion that would be within the proposed golf course footprint would be revegetated. Therefore, implementing Alternative 2 would have a beneficial effect by restoring some areas that are actively eroding under the existing conditions (See Impact 3.6-1 (Alt. 2) in Section 3.6, "Earth Resources". This effect would be beneficial.

For a discussion of potentially significant short-term risks of surface/soil erosion within the study area and proposed mitigation measures, see Impact 3.6-1 (Alt. 2) in Section 3.6, "Earth Resources").

No mitigation is required.

IMPACT 3.4-4 (Alt.2)	**Fine Sediment and Nutrient Retention within the Study Area.** *Implementing Alternative 2 would directly reduce the channel capacity and raise the streambed elevation in several subreaches to increase the frequency and duration of overbanking, enlarge the area of functional active floodplain, and offset past natural geomorphic adjustments to historic disturbances. Implementing Alternative 2 would result in a substantial beneficial improvement in fine sediment and nutrient retention in the study area relative to the existing degraded condition. This effect would be* ***beneficial****.*

Under Alternative 2, the channel length would be increased by 1,590 feet by reconnecting historic meanders and constructing new channel sections. The channel bed profile would be raised 2–4 feet, and the streambank heights would be lowered to reduce channel capacity closer to 500 - 550 cfs along 4,190 feet. The channel dimensions (width, depth, cross-section area) in reconnected and constructed sections would be reduced through both constructed modifications and process-based changes over time to arrive at a channel capacity closer to 550 cfs. These changes would increase the frequency and duration of overbank flows and enlarge the area inundated by small to moderate flood events (i.e., 2-year to 5-year events). The active floodplain in the study area would be increased from 36 acres to 57 acres, an increase of 21 acres, by reactivating portions of the surrounding former floodplain (now a terrace). The enlarged active floodplain (see Exhibit 3.3-15) would increase opportunities for shallow inundation that slows water, deposits sediment, and recharges soil moisture across the floodplain to support dense vegetation that physically traps sediment and biologically takes up nutrients. Sections of the 5,000 feet of modified existing channel would have a raised bed elevation at grade control locations and would be expected to undergo sediment deposition that raises the bed elevation between the grade control sections over time, with backwater and raised water surfaces between riffles. Therefore, overbanking frequency could also eventually improve in these areas. The 4,240 feet of unmodified existing channel (upstream and downstream of all proposed actions) would remain inset between high banks and would not experience increased overbanking to the surrounding terrace.

Under Alternative 2, fine sediment and nutrient retention in the study area would be substantially improved relative to the existing degraded condition and would result in a beneficial reduction of these pollutants released downstream to the Upper Truckee River or transported to Lake Tahoe. This effect would be beneficial.

No mitigation is required.

IMPACT 3.4-5 (Alt.2) **Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Alternative 2 would involve making major modifications to the channel bed profile, bank and bed materials, and hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Naturally declining, post-disturbance watershed coarse sediment yield would continue and, potentially, would be worsened, particularly during the initial channel adjustment phase, with possible adverse effects on downstream channel erosion and beach erosion adjacent to the river mouth (e.g., Cove East and Barton Beach). In the long term, climate change effects could either exacerbate or counteract present trends. Over the long term, the potential effects could range from worse than the existing degraded condition to a possible improvement, depending on climate influences. Any determination regarding climate change effects on coarse sediment transport and delivery downstream would be too speculative for a meaningful conclusion. Over the short term, implementing Alternative 2 would modify coarse sediment transport and deposition within various portions of the study area and likely decrease coarse sediment delivery to downstream reaches. This short-term impact would be* ***potentially significant****.*

Alternative 2 would involve making major changes to the streambed profile throughout the treatment reach (RS 1400 to RS 8800). The streambed profile would be modified by activating reconnected and newly constructed meander segments at higher bed elevations, installing a series of armored riffles in the existing channel segments that would remain part of the proposed alignment, and constructing anchored high-gradient riffles at the upstream and downstream ends of the project. These features would raise several segments of the existing streambed profile by up to 1 to 3 feet near the boulder steps and anchored high gradient riffles and by as much as 3 to 5 feet in other areas, and they would leave the unmodified sections of streambed at existing elevations in other locations (see Exhibit 2-6).

The pattern of proposed streambed treatments would create several relatively abrupt changes in bed elevation at the time of construction. The design approach constructs a series of on-grade armored riffles to define the long profile between reconnected sections and anticipates and expects that natural geomorphic processes would make adjustments within the treatment reaches to redistribute bed materials and refine channel dimensions and shape over time. The proposed upstream and downstream anchored high-gradient riffles would be designed to provide key long-term controls on the eventual stream profile for the entire 9,190-foot proposed channel, supported by a series of armored riffles.

Based on the conceptual design, there would be approximately five transitions from existing channel sections downstream to reconnected or newly constructed channel sections at higher bed elevation. These transitions would experience hydraulic constriction as flows move from the enlarged existing channel into the smaller, higher, geomorphically sized channel. Each of these hydraulic constrictions could experience a range of local erosion and sedimentation effects that have not been quantified at the conceptual design level, depending on the resistance of the bed and banks, the size and volume of bed material, and the water surface elevations and slopes. Net sedimentation, particularly of coarse sediment, may occur upstream of these constrictions, but local flow acceleration and/or scour within the smaller reconnected or constructed channels would also be possible.

There would be five separate sections of existing channel between reconnected and constructed meander sections, and it is possible that hydraulic conditions, sediment transport capacity, and sediment supply to each of these sections would vary, at least for several years until the channel profile adjustments have been completed and bedload is more readily conveyed downstream through each channel section over a range of streamflows. Until such time, net coarse sediment deposition would occur within portions of the study area and reduce coarse sediment discharged downstream.

Implementing Alternative 2 would reduce but not halt long-term streambank sources of coarse sediment in the treated reaches because bank heights would be lowered and biotechnical streambank protection would be emphasized in the reconnected and constructed channel segments. Long-term coarse sediment supply generated by channel erosion may be reduced relative to existing conditions and the No Project/No Action Alternative.

The channel bed elevation irregularities may prompt hydraulic conditions and geomorphic responses that substantially impair transport of coarse sediment from upstream sources through the project reach for an undetermined period of years until the river makes natural adjustments via erosion and sedimentation to smooth out the bed profile within the treatment reaches. It is possible that such interim reductions of bedload transport within portions of the study area or bedload discharge to downstream reaches could increase stream channel erosion downstream if sufficient coarse sediment supply is not locally available in those reaches. Channel erosion prompted by the reduced coarse sediment supply could result in water quality degradation within and/or downstream of the study area. This short-term impact would be potentially significant.

Over the long-term, delivery of coarse sediment to downstream reaches and eventually to the beaches by the river mouth could be diminished proportional to the reduction of coarse sediment sources from eroding streambanks in the study area. However, as under the No Project/No Action Alternative, there are potentially offsetting factors that may result over the long-term from climate change. The net effect on downstream river dynamics and beach erosion is highly uncertain and could be either worse or better than current conditions, depending on climate influences. Even after thorough investigation, any determination regarding climate change effects on coarse sediment transport and delivery downstream would be speculative. This long-term impact would be less than significant.

Mitigation Measure 3.4-5 (Alt. 2): Monitor and Supplement Coarse Sediment Delivery Downstream

During the period of channel adjustments following construction and until the streambed profile attains a relatively continuous slope, where bedload deposition within the study area has adjusted and coarse sediment supply net input approximately equals net output from the study area, State Parks will monitor coarse sediment supply entering the study area, deposition within the treated reaches, and discharge to downstream reaches (i.e., at the U.S. 50 crossing) at least once a year (make observations of net deposition or scour during low water conditions). If substantial areas and volume of coarse sediment deposition is occurring within the study area and/or coarse sediment discharge to downstream reaches is substantially less than sediment input from upstream sources, State Parks will conclude that a project-related effect on coarse sediment delivery may be occurring. Coordinated adaptive management, administered by the Upper Truckee Watershed Advisory Group (UTRWAG) will review and evaluate monitoring data and project conditions and recommend next steps, including continuation or revision of monitoring, corrective actions or interventions, or documentation. If the UTRWAG determines there is a significant worsening coarse sediment impact, State Parks, in coordination with land managers of the downstream river reaches (i.e., Conservancy, USFS, City of South Lake Tahoe), will assess whether any adverse channel erosion and water quality effects might result and will recommend a plan to monitor or take corrective action, which may include introduction of supplemental coarse sediment (e.g., gravel,) using washed, sorted materials and methods that minimize temporary risks to water quality, biologic resources, and recreation uses. The quantity and size classes of any required supplemental coarse sediment introduced downstream would be determined annually in coordination with the land managers downstream along the river.

With implementation of Mitigation Measure 3.4-5 (Alt. 2), Impact 3.4-5 (Alt. 2), the potential downstream adverse geomorphic effects and water quality consequences of short-term interruption of coarse sediment delivery, would be less than significant, because the gravel would be supplemented, as necessary.

IMPACT 3.4-6 (Alt.2)	**Short-Term Risk of Surface Water or Groundwater Degradation during Construction.** *Implementing Alternative 2 would require construction activities along or in the channel of the Upper Truckee River and sections of Angora Creek and the unnamed creek. Although temporary BMPs would be implemented, short-term risks of water quality degradation during construction could occur during each summer construction season or the intervening winters. Implementing Alternative 2 could result in short-term violations to the Basin Plan water quality standards, including turbidity due to construction implementation. This short-term impact would be* ***potentially significant.***

Implementing Alternative 2 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb areas in uplands (west of the river), as well as in the active floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek. The extent of "in-channel" (i.e., channel that normally carries flows year-round) work varies by year (see Alternative 2 construction schedule section in Table 2-4). Bridge removals, the new bridge installation, grade controls, bank protection measures, and transition connections between channel segments would require work in the active channel. The reconnected meanders and new constructed meanders, as well as portions of the floodplain reconstruction, existing golf course reconfiguration, and new golf course construction, would be completed "off-channel" (outside of the active channel). Nearly all of the disturbance areas, access routes, and staging areas (except the driving range) proposed north and/or east of the Upper Truckee River would be within the 100-year floodplain. Most of the disturbance areas, access routes, and staging locations proposed west of the Upper Truckee River would be outside the 100-year floodplain (see Exhibit 2-7).

Permits and approvals from several entities (e.g., El Dorado County, TRPA, Lahontan RWQCB, USACE, and California Department of Fish and Game) that would impose conditions and requirements to minimize construction phase risks of water quality degradation by sediment or other pollutants will be required for the project. Although the general types of permit documents and their components are known (e.g., SWPPP, Dewatering Plan/BMP Plan), the specific measures, performance standards, and enforcement elements would not be established until the time of acquisition. Several general construction management measures would be implemented to minimize environmental impacts, along with specific measures to protect water quality (see Chapter 2, "Project Alternatives"). Exact erosion control measures (BMPs) and their performance standards are not specified at this time, but general BMPs would include use of construction fencing, silt fences, hay bales, temporary settling basins, vegetation protection, hydroseeding, and straw mulch. Construction activities that would occur within the existing streambed or streambanks would require temporary dewatering of surface water in the river channel, and where subsurface access is needed, temporary dewatering/pumping of groundwater that seeps into the work area may also be required. Conceptual approaches to dewatering have been identified for various elements of Alternative 2 in-channel work, but specific measures have not yet been determined. Efforts would be made to work as quickly as possible to move from initial disturbance through final revegetation throughout the study area, but it is expected that disturbed areas would be exposed to winter conditions between summer construction seasons. Winterization protection could be needed throughout the construction zone, and possible overwinter use of staging, storage, or access is likely.

All temporary stormwater controls and/or overwinter flood flow protections would likely be designed and sized to meet typical regulatory requirements (e.g., 20-year rainstorm for stormwater, 50-year peak streamflow) but could be overwhelmed by a larger event if it occurred during the construction period. However, the probability of an event of greater magnitude occurring during either the summer low-flow seasons or the intervening winters is low and would not be reasonably foreseeable.

Based on the conceptual information regarding proposed construction management for Alternative 2, it remains possible that violations of water quality standard could occur, at least for short periods during each summer's activities and/or over each intervening winter and snowmelt season. The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. State Parks would request an exemption for the potential construction-related violation(s) of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and magnitude would be potentially significant. The surface water and/or groundwater degradation caused could potentially be of a magnitude and duration that would impair beneficial uses of the Upper Truckee River, including visible turbidity that impairs aesthetic values or other potential effects on other beneficial uses. Impairment of beneficial uses would be expected to require considerably higher turbidity levels, orders of magnitude above the very low background for the river. Regardless, the significance conclusion for this environmental document is based on the potential to violate the turbidity standard; therefore, the impact is considered potentially significant.

Mitigation Measure 3.4-6 (Alt. 2): Prepare and Implement Effective Site Management Plans.

State Parks will be required to develop and implement several construction phase site management plans as part of various permit and approval requirements, including but not limited to, grading and erosion control plan, Storm

Water Pollution Prevention Plan (SWPPP), spill prevention plan, dewatering and channel seasoning plan, winterization plan, and monitoring and oversight plan. The following measures will be implemented by State Parks within each of these plans to be developed for specific permits or as independent mitigation measures:

- Restrict the area and duration of construction disturbance to the absolute minimum necessary to accomplish the work.

- Design, install, and maintain temporary BMPs to protect disturbed areas and minimize soil erosion, prevent surface runoff interaction with disturbed surfaces, and limit the potential for release of sediment, nutrients, or otherwise contaminated water into surface water bodies or groundwater recharge areas for storm events up to the 20-year precipitation event.

- Design, install, and maintain internally draining construction area(s) on both sides of the Upper Truckee River, Angora Creek, and the unnamed creek within the study area to prevent discharge of untreated stormwater to these surface water bodies. Anticipate runon from upslope groundwater seeps west of the Upper Truckee River, and reroute it around the construction zone.

- Establish specific locations for construction vehicle/equipment refueling, maintenance, and storage that are lined and/or bermed to prevent release of any potential spills into surface water or groundwater.

- Provide winterization that isolates and protects disturbed areas from high streamflow on the Upper Truckee River and Angora Creek (up to the 50-year event).

- Protect stockpiled and transported materials or debris from wind or water erosion.

- Avoid overwinter storage of materials, vehicles, equipment, or debris within the 100-year floodplain.

- Provide site-specific and reachwide dewatering/bypassing plans that indicate the scheduling approach and or maximum diverted flows to minimize risks from summer thunderstorms, specific diversion/bypass/ dewatering methods and equipment, defined work areas and diversion locations, the types and locations of temporary BMPs for the diversions and reintroduction points, measures and options for treating turbid water before release back to the channel, and stated water quality performance standards.

- Provide wetting flows before activation of new and reconnected river channel sections based on a “channel seasoning” plan that indicates the water source(s), volumes and duration required, phased placement of clean, washed gravels; and the measures and options for treating potentially turbid water.

- Monitor the status and effectiveness of temporary erosion control, stormwater facilities, and flood flow protection measures throughout the construction area, including each of the internally draining zones that could separately discharge to various surface water bodies. Monitor turbidity in the Upper Truckee River upstream and downstream of the construction zone and, if needed to further describe background, upstream in Angora Creek. Monitoring will be conducted by the engineer or its qualified representative regularly during summer construction and on an event basis when runoff equals or exceeds the BMP design standards. Failures and/or threats of BMP failures will be documented and remedial measures identified for implementation. BMP failures will be repaired within 24 hours of documentation.

With implementation of Mitigation Measure 3.4-6 (Alt. 2) as described above, Impact 3.4-6 (Alt. 2), the likelihood and potential magnitude of short-term water quality degradation that could persist and impair beneficial uses, would be minimized because effective site management plans would be prepared and implemented. However, the potential for violations of narrative or numerical water quality objectives in the Basin Plan at least for short periods of time cannot feasibly be eliminated. The residual impact would remain significant and unavoidable.

IMPACT 3.4-7 (Alt.2) **Short-Term Risk of Surface Water or Groundwater Degradation Following Construction.** *Implementing Alternative 2 would require in-channel construction activities, and the biotechnical streambank treatments and other revegetated areas could be vulnerable during a flood flow within the first few years following construction. Furthermore, the proposed treatments would require a period of channel adjustment following construction to meet final design. Therefore, implementing Alternative 2 could result in potential short-term turbidity that violates the turbidity water quality standard in the Basin Plan (i.e., within 10 percent above background). This short-term impact would be* ***potentially significant****.*

A possible risk of short-term water quality degradation within the first few years after construction could arise from two potential mechanisms:

- expected natural channel adjustments in accordance with project design and/or
- a large flood event (e.g., 25-year recurrence or greater) occurring in the first few years (approximately 5 years) after construction.

A natural channel adjustment effect could occur where engineered designs are implemented. In particular, such adjustments would be expected as normal post-construction channel dynamics for sites where the selected restoration design does not impose the final channel size, shape, or bed and bank materials directly during construction. Expected channel adjustments would likely require at least a few years (approximately 3–5) where flows approach or exceed the geomorphic design flow to reach equilibrium. Alternative 2 includes expected natural channel adjustments as part of the design approach for the reconnected and constructed meanders, as well as the segments of existing channel between them. Alternative 2 incorporates grade control and bank protection elements at the upstream and downstream extents of the treated reaches (RS 1400 and RS 8800) to define the area of intended channel treatment and response. As described for Impact 3.4-5 (Alt. 2), changes in coarse sediment transport and deposition within the treatment reaches would be expected, particularly during the initial channel adjustment phase. The potential magnitude and duration of water quality degradation would vary by the type and degree of channel adjustment, but the effects could violate water quality standards. Channel adjustments in the form of streambed material sorting and/or net streambed or streambank erosion could produce turbidity effects. The effects would be greatest at each site of adjustment within the study area and would dissipate after each erosion event ends, but it is possible that turbidity might be detectable and extend downstream of the study area, at least for short periods.

Normal channel adjustments would most likely occur during and just following peak seasonal streamflow, at flows around or higher than the intended design capacity of 550 cfs. Under existing conditions and the No Project/No Action Alternative, such flows may cause local streambed erosion (because there are knickpoints within the study reach), and may result in streambank erosion because the bank heights are high. These flows and expected channel adjustments would occur at times of the year when background turbidity would be elevated and aesthetic beneficial uses are lower than some periods of the recreation season. These channel adjustments would be restricted to the treatment reaches, and they may pose a level of water quality risk worse than existing conditions or that under the No Project/No Action Alternative (i.e., for the risk of temporary increases in turbidity beyond the stringent turbidity standard of <10 percent above natural background conditions). Although it would be difficult to estimate an appropriate "natural" background condition due to natural variability (e.g., normal storm effects, recreation and wildlife user effects), it is possible that violations of narrative or numeric water quality standards could result. This would be potentially significant. However, the seasonal timing of likely channel adjustments would minimize the potential for impairment of beneficial uses, because background turbidity may be elevated in high flow events and, in relation to the most sensitive potential beneficial use impairment – aesthetic value, the likely timing of high flow events may be when recreation use is low. Nonetheless, because the turbidity standard could be violated by short-term turbidity increases, this impact is considered potentially significant.

The Upper Truckee River is an unregulated river; therefore, it would not be possible to avoid or control streamflow if a large flood occurs while the project area was still adjusting to construction. Although the probability of a large flood flow (i.e., 25-year recurrence peak flow) in any given year would be relatively low (4 percent), the project area could be vulnerable for a few consecutive years, so the overall probability increases and such an event could be reasonably foreseeable during a 5-year post-construction period (i.e., 20-percent chance).

Revegetation on restored floodplains that might be adequate to protect surfaces against typical shallow overbank flows shortly after construction might not yet be mature enough to withstand a large flood. Mixed in-channel treatments of rock, wood, and living materials might not have reached maximum hydraulic resistance within the construction period. Also, it is not possible to predict whether all of the reactivated floodplain surfaces would remain stable, particularly on existing terrace surfaces that have accumulated organic material and fine sediment for decades (i.e., in old oxbows or other channel remnants).

A large flood occurring within the first few years following construction could violate water quality standards within the study area and potentially downstream. Pollutant sources from surface erosion of the reactivated floodplains and/or remobilization of accumulated organics and sediment would terminate after the flood event ends, but water quality standards could be violated, at least for short periods (e.g., hours, days, weeks), and effects could extend downstream of the study area. A large flood effect would most likely occur during winter storms, including rain-on-snow events when absorption rates are low and runoff rates are high. During these large events, background turbidity tends to be extremely high, and aesthetic beneficial uses are less prevalent.

Although unexpectedly large flows could damage the active channel and/or backfilled channels, causing instability that could continue beyond the initial flood event and/or propagate over time to affect additional locations, this could also occur under existing conditions. A flood flow of this same magnitude under existing conditions or the No Project/No Action Alternative would also produce streambed and streambank erosion that could mobilize some areas of the existing floodplain. However, the project would modify the specific locations, areal extent, and soil/vegetation conditions that would be exposed to the flows in the channel or across the reactivated floodplain and localized risks of increased erosion and sedimentation could occur that may result in violations of narrative or numeric water quality standards, at least briefly. This short-term impact would be potentially significant.

The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. State Parks would request an exemption for the potential construction-related violation(s) of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and magnitude would be potentially significant.

Mitigation Measure 3.4-7A (Alt. 2): Minimize Fine Sediment and Organic Material Available for Mobilization.

Final project design and revegetation specifications for a reactivated channel and floodplain that has remnant channels with accumulated fine sediment and/or organic materials will include measures to minimize the risk that such materials would become mobilized if a large flood flow occurs during the first few years after construction. The measures would remove and/or stabilize the materials adequately to resist expected erosive forces if a large flood (i.e., 25-year peak flow) occurred within the first 5 years after implementation:

- Remove loose, unvegetated, or otherwise unstable fine sediment and/or organic material within remnant channel sections to be reactivated (either directly connected to the restored channel or as part of reactivated floodplain) to eliminate the potential pollutant source. The excavated materials could be salvaged for soil amendment and revegetation use in off-channel areas if suitable or will be disposed of properly off-site.

- Revegetate loose, unvegetated, or otherwise unstable fine sediment and/or organic material within remnant channel sections to be reactivated (either directly connected to the restored channel or as part of reactivated floodplain) to increase roughness and reduce velocities. Revegetation of these areas will meet species, density, planting methods, irrigation, and success criteria similar to streambank plantings.

Mitigation Measure 3.4-7B (Alt. 2): Adaptively Manage Potential Flood Damage in the Interim Period after Construction.

State Parks will develop and implement a project reach adaptive management plan focused on potential short-term water quality degradation that could result if unexpectedly large flood flows occur within the first 5 years after construction. The plan would identify specific data collection and monitoring protocols, describe decision-making processes and authorities for corrective actions or activities. The performance criteria for the corrective actions would focus on preventing initial flood damage or turbidity effects from becoming a persistent, recurring, or chronic source.

With implementation of Mitigation Measures 3.4-7A (Alt. 2) and 3.4-7B (Alt. 2) as described above, Impact 3.4-7 (Alt. 2), short-term risk of surface water or groundwater degradation following construction, would be minimized, because the amount of fine sediment and organic material available for mobilization would be minimized and potential flood damage in the interim period after construction would be adaptively managed. However, the potential for violations of narrative or numerical water quality standard for turbidity, at least for short periods of time, cannot be feasibly eliminated. The residual impact would remain significant and unavoidable.

IMPACT 3.4-8 (Alt.2)	Risks of Stormwater and Groundwater Contamination from Golf Course Operations. *Alternative 2 would involve relocating and slightly expanding the golf course footprint area, but modifying its configuration to reduce areas in SEZ , reduce intensively managed landscaping, and increase buffers along surface water bodies, and upgrading the irrigation and drainage systems. Risks of surface water and groundwater contamination could occur despite some localized improvements and continued water quality protection regulations, with updated monitoring, reporting, and response requirements under direct oversight of the Lahontan RWQCB. This impact would be* **potentially significant***.*

Alternative 2 would reduce managed golf course landscaping in SEZ and buffers of minimally managed or natural landscape would be widened adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek. Alternative 2 would involve constructing new, updated, and more effective irrigation and drainage systems and employing turf types and a landscaping approach and management methods that minimize the rate of chemical use and reduce opportunities for excess application and/or accumulations. Risks related to maintenance vehicle operation along the river and on golf course bridges would be substantially reduced by the increased buffer widths and the elimination of four crossings over the Upper Truckee River and all crossings of Angora Creek. Operational risks related to the clubhouse facilities, maintenance yard, and parking would remain unchanged or possibly would be improved by paving and providing curb/gutter and other BMPs for the existing unpaved parking. These measures could result in potential improvements in water quality protection relative to existing conditions.

However, Alternative 2 would involve expanding the overall footprint of the golf course, including areas of upland that have not previously been developed for this type of land use. Much of this upland area was previously disturbed by a former quarry, logging, roads, and trails but it also has sensitive areas of surface and groundwater interaction. The footprint area would be increased due to larger areas of minimally managed and natural landscapes included, but the intensively managed/turf areas would be reduced compared to existing conditions. The relocated golf course areas west of the river would include new stormwater features that either need to avoid and/or incorporate natural drainages to the Upper Truckee River that are presently outside of any developed storm drainage system. At the conceptual level of design, it is uncertain whether the specific stormwater system features would include adequate protections to: 1) isolate upslope (unaltered) runon from stormwater or irrigation drainage off of managed golf course surfaces; 2) prevent infiltration and percolation of golf course runoff that may include contaminants into shallow groundwater via natural seeps and springs and/or the planned pond; and; 3) adequately detain and pre-treat stormwater that may be released or overflow to the Upper Truckee River. It is expected that the major reconfiguration of the golf course under Alternative 2 would prompt the Lahontan RWQCB to revisit the facility's waste discharge permit, likely updating monitoring locations and strengthening monitoring and reporting requirements, but the details of these requirements are not yet known.

Implementing Alternative 2 would result in risks posed by the golf course layout and operations that might locally be increased within the study area relative to those under existing conditions or the No Project/No Action Alternative. This impact would be potentially significant.

Mitigation Measure 3.4-8 (Alt. 2): Prevent Water Quality Degradation from Golf Course Operations.

State Parks will incorporate measures within the final stormwater system design that:

1. limit opportunities for irrigation and stormwater that will be in contact with managed golf course landscaping to interact with unaltered runon from upslope areas within Washoe Meadows SP. This can be accomplished by incorporating buffer strips along downslope sides of intensively managed turf, intercepting and routing flows around landscape areas if needed, allowing natural drainages to continue to convey water from upslope without adding golf course runoff to those drainages by routing the golf course stormwater to other artificial drainages, or similar measures;

2 prevent irrigation and stormwater that will be in contact with managed golf course landscaping from interacting with shallow groundwater and/or surface water in the vicinity of natural seeps within Washoe Meadows SP. The measures required would be determined by site-specific analysis of the surface/groundwater interactions and could include the installation of sheet pile and/or other subsurface barriers; and,

3 minimize potential percolation and/or surface overflow from any new detention and/or storage pond features that will have irrigation or stormwater runoff from the golf course landscaping through inclusion of adequate liners and appropriate sizing.

With implementation of Mitigation Measure 3.4-8 (Alt. 2), as described above, the risk of possible sediment or chemical pollutant discharges to surface or groundwater would be minimized over the life of golf course operations and Impact 3.4-8 (Alt. 2) would be less than significant.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.4-1 (Alt.3)	Stream Channel Erosion within the Study Area. *Alternative 3 would involve making direct changes to the channel of the Upper Truckee River and the mouths of Angora Creek and the unnamed creek. The changes would offset past geomorphic response to historic disturbances and the undersized bridges within the study area by lengthening the channel, reactivating and constructing more appropriately sized channel sections, improving floodplain connectivity, and removing bridges. These modifications would prompt improved stream function and reduce overall erosion of the streambed and banks, reducing the release of sediment and nutrients that degrade the river and lake water quality relative to existing conditions and the No Project/No Action Alternative. This would be a substantial long-term benefit overall, but localized erosion could increase at the bridge removal sites, downstream of the treated reaches, and/or in the two tributary creeks. This localized risk of increased erosion would be* ***potentially significant****.*

Implementing Alternative 3 would reduce potential runoff volumes or peak flows generated within the study area relative to Alternative 2 and the No Project/No Action Alternatives (see Impacts 3.3-1 [Alt. 3] and 3.3-2 [Alt. 3] in Section 3.3, “Hydrology and Flooding”) because impervious surface areas would be decreased. This would be a beneficial effect on the driving forces of channel erosion.

The modifications to the existing streambank stabilization features and the meander reconnections and new channel construction on the Upper Truckee River under Alternative 3 would be similar to those under Alternative 2, producing the same long-term beneficial reduction in channel erosion relative to existing conditions and the No Project/No Action Alternative.

As under Alternative 2, the raised water surface elevations in the treated reaches would result in a steep transition downstream to the untreated existing Upper Truckee River channel under Alternative 3, which would result in similar potential impacts of localized channel and overbank erosion downstream of RS 2000.

The changes to the alignment, length, and mouth elevation of Angora Creek and the unnamed creek under Alternative 3 would be similar to those under Alternative 2, which would result in similar potential impacts on channel stability of the two tributary creeks.

Similar to Alternative 2, all the existing golf course bridges would be removed under Alternative 3, which would result in similar potential impacts on localized erosion and sedimentation at the bridge removal sites.

Although the overall long-term channel erosion impact for the treated reaches of the Upper Truckee River under Alternative 3 would be beneficial compared to existing conditions and the No Project/No Action, some portions of the study area could experience increased channel erosion. This impact would be potentially significant.

Mitigation Measure 3.4-1A (Alt. 3): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.4-1A (Alt. 2).

Mitigation Measure 3.4-1B (Alt. 3): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

This mitigation measure is identical to Mitigation Measure 3.4-1B (Alt. 2).

Mitigation Measure 3.4-1C (Alt. 3): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-1C (Alt. 2).

With implementation of Mitigation Measures 3.4-1A (Alt. 3), 3.4-1B (Alt. 3), and 3.4-1C (Alt. 3) as described above, Impact 3.4-1 (Alt. 3) would be less than significant for the same reasons described for Mitigation Measure 3.4-1A (Alt. 2) through Mitigation Measure 3.4-1C (Alt. 2).

IMPACT 3.4-2 (Alt.3)	Risk of Channel Erosion Damage to Sewer Pipelines. *Implementing Alternative 3 would improve existing protective cover over sewer pipelines crossing the Upper Truckee River, but with the new alignment, the channel would be placed within 25 feet of the buried pipeline in two locations. Natural geomorphic adjustments following construction may pose a risk of damage to these portions of the sewer pipelines, as well as the two Angora Creek crossings, potentially releasing untreated wastewater to the river and creek that would eventually reach Lake Tahoe. This impact would be* ***potentially significant****.*

Similar to Alternative 2, implementing Alternative 3 would improve protection at two existing buried sewer pipeline crossings under the Upper Truckee River. However, the proposed active channel would be located within 25 feet of the sewer pipeline at two new sites, with additional bank stabilization and lateral migration measures designed to meet an as-yet-undetermined flood event standard. Changes to the mouth of Angora Creek would be made, including bed and bank stabilization designed to meet as-yet-undetermined flood event standards. Proposed grading and excavation in the areas of golf course and floodplain modifications could potentially damage sewer lines of uncertain depth and location within the study area.

Under Alternative 3, the risk of damage to the buried sewer pipelines would be reduced relative to existing conditions and the No Project/No Action Alternative for some locations but would be increased in other portions of the study area. This impact would be potentially significant.

Mitigation Measure 3.4-2A (Alt. 3): Protect Vulnerable Portions of the Sewer Pipeline up to the 100-Year Flood Event.

This mitigation measure is identical to Mitigation Measure 3.4-2A (Alt. 2).

Mitigation Measure 3.4-2B (Alt. 3): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is identical to Mitigation Measure 3.4-2B (Alt. 2).

Mitigation Measure 3.4-2C (Alt. 3): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks

This mitigation measure is identical to Mitigation Measure 3.4-2C (Alt. 2).

With implementation of Mitigation Measures 3.4-2A (Alt. 3), 3.4-2B (Alt. 3), and 3.4-2C (Alt. 3) as described above, Impact 3.4-2 (Alt. 3), the potential increased risk of sewer pipeline damage and water quality degradation, would be less than significant for the same reasons described for Mitigation Measures 3.4-2A (Alt. 2) through 3.4-2C (Alt. 2).

IMPACT 3.4-3 (Alt.3)	**Long-Term Surface/Soil Erosion within the Study Area.** *Alternative 3 would not involve modifying the topography, soils, vegetation, or drainage on the areas of existing surface erosion caused by prior surface disturbances within Washoe Meadows SP. Existing areas of active erosion would persist. This impact would be* ***less than significant.***

Similar to Alternative 1, no changes to the areas of accelerated soil erosion within Washoe Meadows SP would be expected under Alternative 3. Existing adverse conditions would continue. The long-term benefits expected under Alternative 2 would not occur as part of the project. However, as part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land. However, additional development in the remaining park area would not occur, because much of the area is within sensitive low-capability lands. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA. For a discussion of potentially significant short-term risks of surface/soil erosion within the study area and proposed mitigation measures, see Impact 3.6-1 (Alt. 3) in Section 3.6, "Earth Resources"). This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-4 (Alt.3)	**Fine Sediment and Nutrient Retention within the Study Area.** *Implementing Alternative 3 would directly reduce the channel capacity and raise the streambed elevation in several subreaches to increase the frequency of overbanking, enlarge the area of functional active floodplain, and offset past natural geomorphic adjustments to historic disturbances. Implementing Alternative 3 would result in a substantial beneficial improvement in fine sediment and nutrient retention in the study area relative to the existing degraded condition. This effect would be* ***beneficial.***

Similar to Alternative 2, the channel would be lengthened, the bed profile would be raised, bank heights would be lowered, and channel capacity would be reduced under Alternative 3. The same changes in overbank frequency, duration, and enlarged active floodplain anticipated under Alternative 2 would result under Alternative 3. The same beneficial improvements to fine sediment and nutrient retention within the study area and reduction of pollutants released downstream expected under Alternative 2 would result under Alternative 3.

Under Alternative 3, fine sediment and nutrient retention in the study area would be substantially improved relative to the existing degraded condition and would result in a beneficial reduction of these pollutants released downstream to the Upper Truckee River and/or Lake Tahoe. This effect would be beneficial.

No mitigation is required.

IMPACT 3.4-5 (Alt.3) **Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Alternative 3 would involve making major modifications to the channel bed profile, bank and bed materials, and hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Naturally declining watershed coarse sediment yield would continue and potentially would be worsened, particularly during the initial channel adjustment phase, with possible adverse effects on downstream channel erosion and beach erosion adjacent to the river mouth (Cove East and Barton Beach). In the long term, climate change effects could either exacerbate or counteract present trends. Over the long term, the potential effects could range from worse than the existing degraded condition to a possible improvement. Any determination regarding climate change effects on coarse sediment transport and delivery downstream would be too speculative for a meaningful conclusion. Over the short term, implementing Alternative 3 would modify coarse sediment transport and deposition within various portions of the study area and likely decrease coarse sediment delivery to downstream reaches. This short-term impact would be* ***potentially significant****.*

Alternative 3 would involve making the same changes to the streambed profile and the same changes to streambank and streambed materials as under Alternative 2, and the channel adjustments following construction would be expected to be the same as under Alternative 2. This would produce the same short-term reductions in coarse sediment discharged downstream. This short-term impact would be potentially significant.

Implementing Alternative 3 would result in the same highly uncertain long-term effects on coarse sediment delivery downstream and local beach erosion as Alternative 2. This long-term impact would be less than significant.

Mitigation Measure 3.4-5 (Alt. 3): Monitor and Supplement Coarse Sediment Delivery Downstream

Mitigation Measure 3.4-5 (Alt. 3) is identical to Mitigation Measure 3.4-5 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.4-5 (Alt. 3), Impact 3.4-5 (Alt. 3) would be less than significant.

IMPACT 3.4-6 (Alt.3) **Short-Term Risk of Surface Water or Groundwater Degradation during Construction.** *Implementing Alternative 3 would require major or prolonged construction activities along or in the channel of the Upper Truckee River and sections of Angora Creek and the unnamed creek. Although temporary BMPs would be implemented, short-term risks of water quality degradation during construction could occur during each summer construction season or the intervening winters. Implementing Alternative 3 could result in short-term violations to the Basin Plan water quality standards, including turbidity due to construction implementation. This short-term impact would be* ***potentially significant****.*

Similar to Alternative 2, implementing Alternative 3 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb the active floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek, with similar phasing (see Table 2-6), access, staging, and storage (see Exhibit 2-9). However, Alternative 3 would not include construction of new golf course facilities west of the Upper Truckee River.

Similar to Alternative 2, permits and approvals would need to be obtained from several entities, but the specific measures, performance standards, and enforcement elements required are not yet known. The same general construction management measures and general BMPs would be included as for Alternative 2, with similar dewatering approaches and winterization needs. As with Alternative 2, the probability of a large storm runoff or streamflow event that exceeds temporary capacity occurring during construction would not be reasonably foreseeable.

Based on the conceptual information regarding proposed construction management for Alternative 3, it remains possible that violations of water quality standards could occur, at least for short periods during each summer's activities and/or over each intervening winter and snowmelt season. The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. It is anticipated that State Parks would request an exemption for the potential construction-related violation(s) of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and magnitude would be potentially significant. The surface water and/or groundwater degradation caused by the risk of temporary turbidity increases could potentially be of a magnitude and duration that would impair beneficial uses of the Upper Truckee River, including visible turbidity that impairs aesthetic values or other potential effects on other beneficial uses. Impairment of beneficial uses would be expected to require considerably higher turbidity levels, orders of magnitude above the very low background value for the river. Regardless, the significance conclusion for this environmental document is based on the potential to violate the turbidity standard; therefore, the impact is considered potentially significant.

Mitigation Measure 3.4-6 (Alt. 3): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.4-6 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.4-6 (Alt. 3), the residual Impact 3.4-6 (Alt. 3) would remain significant and unavoidable.

IMPACT 3.4-7 (Alt.3)	Short-Term Risk of Surface Water or Groundwater Degradation Following Construction. *Implementing Alternative 3 would require major or prolonged construction activities. Biotechnical streambank treatments and other revegetated areas could be vulnerable during a flood flow within the first few years following construction. Furthermore, the proposed features would require a period of channel adjustment following construction to meet final design. Therefore, implementing Alternative 3 could result in potential short-term turbidity that violates the water quality standard in the Basin Plan (i.e., within 10 percent increase over natural background levels). This short-term impact would be* ***potentially significant.***

Alternative 3 would have the same river channel impacts as Alternative 2. Potential impacts from overbank and upland areas would be similar to those under Alternative 2, although the area of disturbance west of the river would be avoided and the extent of disturbance in the existing golf course (including active and 100-year floodplain) would be larger.

Mitigation Measure 3.4-7A (Alt. 3): Minimize Fine Sediment and Organic Material Available for Mobilization.

This mitigation measure is identical to Mitigation Measure 3.4-7A (Alt. 2).

Mitigation Measure 3.4-7B (Alt. 3): Adaptively Manage Potential Flood Damage in the Interim Period after Construction.

This mitigation measure is identical to Mitigation Measure 3.4-7B (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measures 3.4-7A (Alt. 3) and 3.4-7B (Alt. 3), the residual Impact 3.4-7 (Alt. 3) would remain significant and unavoidable.

IMPACT 3.4-8 (Alt.3) **Risks of Surface Water and Groundwater Contamination from Golf Course Operations.** *Alternative 3 would involve reducing the golf course footprint, modifying its configuration to reduce areas in SEZ and increase buffers along surface water bodies, and upgrading the irrigation and drainage systems. Risks of surface water and groundwater contamination could still occur but would likely be reduced from existing conditions because of the improvements and continued water quality protection regulations, with updated monitoring, reporting, and response requirements under direct oversight of the Lahontan RWQCB. This impact would be* ***less than significant****.*

Implementing Alternative 3 would reduce the overall footprint of the golf course. The managed golf course landscaping in SEZ would be reduced to 80 acres, and buffers of minimally managed or natural landscape would be widened adjacent to the Upper Truckee River and the unnamed creek. Managed golf course landscaping would be entirely eliminated along Angora Creek. Alternative 3 would involve constructing new, updated, and more effective irrigation and drainage systems and involve employing turf types and a landscaping approach and management methods that could further minimize the rate of chemical use and reduce opportunities for excess application and/or accumulations. Risks related to maintenance vehicle operation along the river and crossing on golf course bridges would be substantially reduced by the increased buffer and elimination of all five crossings of the Upper Truckee River and all crossings of Angora Creek. Operational risks related to the clubhouse facilities, maintenance yard, and parking would remain unchanged from existing conditions and the No Project/No Action Alternative. Additionally, it is expected that the reconfiguration of the golf course under Alternative 3 would prompt the Lahontan RWQCB to revisit the facility's waste discharge permit, likely updating and strengthening monitoring and reporting requirements.

Implementing Alternative 3 would result in a beneficial reduction in risks posed by the golf course layout and operations relative to those under existing conditions and the No Project/No Action Alternative or Alternative 2. This impact would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.4-1 (Alt.4) **Stream Channel Erosion within the Study Area.** *Alternative 4 would involve making direct changes to the channel of the Upper Truckee River, the mouth of Angora Creek, and the mouth of the unnamed creek. The changes would limit continued geomorphic response to historic disturbances and reduce the effects of undersized bridges within the study area by stabilizing the streambed elevation, protecting streambanks, and removing two bridges. These modifications would reduce overall erosion of the streambanks and streambed and reduce the release of sediment and nutrients that degrade the river and lake water quality relative to existing conditions and the No Project/No Action Alternative. This would be a substantial long-term benefit overall, but increased localized erosion could result at the bridge removal sites. This localized risk of increased erosion would be* ***potentially significant****.*

Alternative 4 would not involve modifying the area or location of existing impervious surfaces or making changes to the channel or drainages that would modify runoff volumes or peak flows. (See Impacts 3.3-1 [Alt. 4] and 3.3-2 [Alt. 4] in Section 3.3, "Hydrology and Flooding.") Therefore, Alternative 4 would not involve modify on-site driving forces causing stream channel erosion.

Under Alternative 4, existing streambank stabilization treatments already in place would be replaced and/or repaired. Existing streambed knickpoints would be addressed by installing anchored high-gradient riffles at the upstream and downstream project boundaries and placing boulder steps throughout the treatment reach at intervals to prevent continued streambed erosion. Streambank erosion throughout the treatment reach would be reduced by installing protection measures that generally feature rock armor on outside bends and biotechnical measures on inside bends, as needed, to resist expected shear stress and keep the channel stable up to the 100-year peak flow.

Compilation of the TMDL streambank erosion results (California Water Boards and NDEP 2007:211–215) for specific subreaches of the Upper Truckee River allows a quantitative estimate of the effect of the proposed alternatives on stream channel erosion. Although the specific measures proposed under Alternative 4 were not modeled for the TMDL, they can be represented by using the "bank protection" tier results for the treatment subreaches within the study area. The estimated fine sediment loads from streambank erosion in the study area would be 546 cubic yards, which represents a 55.6-percent reduction for the study area and a 15.8-percent reduction for the entire river relative to existing conditions and the No Project/No Action Alternative (Table 3.4-12). This would be a substantial beneficial effect relative to existing conditions and the No Project/No Action Alternative.

Table 3.4-12
Estimated Stream Channel Bank Erosion of Fine Sediment on the Upper Truckee River under Alternative 4

River Reach	Distance Upstream of Lake(feet)	Bank Erosion of Fine Sediment[1] Alternative 1 (No Project/No Action) (cubic yards)	Bank Erosion of Fine Sediment[1] Alternative 4 (cubic yards)
Downstream reaches	0–40,000	2,451	2,451
Study area reaches	40,000–48,458	1,228	546
Upstream reaches	48,458–79,364	2,451	2,451
Total	**79,364**	**4,320**	**3,638**

Note:

[1] Fine sediment is less than 0.063 millimeter in diameter.

Source: California Water Boards and NDEP 2007 (compiled for these subreaches in Appendix F)

Under Alternative 4, the two existing golf course bridges upstream of holes 6 and 7 (approximately RS 8200 and RS 7575) would be replaced with a single, longer span bridge between RS 7800 and RS 8100 (subreach 3B). The new bridge would span the channel and active floodplain and would not require placing piers in the channel bed; therefore, it is not expected to constrict flows or increase flow velocity in the vicinity. In addition, an inset floodplain would be excavated in the vicinity, and local streambed and streambank protections would be installed at the new bridge. The existing streambed scour and streambank erosion at the two existing undersized bridges would be eliminated. Removal of these two undersized bridges would eliminate the existing high-flow constrictions, modify local hydraulics, slow the velocity at and just downstream of each bridge crossing, and speed up velocities just upstream of each crossing relative to existing conditions. This change in local hydraulics could, if not addressed by sufficient bed and bank stabilization measures, result in increased shear forces sufficient to increase bed and bank erosion upstream of each former bridge. Under Alternative 4, streambed and streambank protection measures would be implemented at each bridge removal site, but the performance standards for those measures are not specified. Therefore, it is possible that localized erosion could be worsened relative to existing conditions and the No Project/No Action Alternative.

Implementing Alternative 4 would not substantially raise the streambed elevation and water surface elevations within the treated reaches (RS 1400 to RS 8800). Minor hydraulic changes in roughness attributable to placement of rock and biotechnical treatments, without reduction in channel capacity, would not be expected to increase shear stress relative to existing conditions in the reach downstream of RS 2000. Because implementing Alternative 4 would not enlarge the active floodplain or increase the frequency of overbanking, no potential effect on return flows disturbing streambanks would be expected.

Alternative 4 would not involve relocating the mouths of Angora Creek and the unnamed creek but may include implementing streambed and streambank protection measures at each existing confluence to match the adjoining treatments and finished grade within the Upper Truckee River. These changes would not substantially modify the length or mouth elevation of either creek.

Although the overall long-term channel erosion impact for the treated reaches of the Upper Truckee River under Alternative 4 would be beneficial compared to existing conditions and the No Project/No Action Alternative, some portions of the study area could experience increased localized channel erosion. This impact would be potentially significant.

Mitigation Measure 3.4-1 (Alt. 4): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

Final design will include specific streambed stabilization and streambank protection measures at each proposed bridge removal site (at least 100 feet upstream and downstream) that will minimize future erosion under the modified hydraulic conditions, as verified by quantitative modeling that demonstrates stability up to the 100-year peak event. The measures may include grading to modify the channel dimensions (e.g., eliminate existing large scour pool) and the shape of the channel bed and banks, along with installation of rock and/or biologic materials.

With implementation of Mitigation Measure 3.4-1 (Alt. 4) as described above, Impact 3.4-1, the potential increase in localized channel erosion, would be less than significant because bed and bank stabilization measures would be provided at and immediately upstream and downstream of the bridge removal sites.

IMPACT 3.4-2 (Alt.4)	Risk of Channel Erosion Damage to Sewer Pipelines. *Implementing Alternative 4 would improve existing protective cover over buried sewer pipelines crossing the Upper Truckee River or within 25 feet of the existing banks and include measures to stabilize the channel to reduce future streambed or streambank erosion. These measures would decrease the risk of damage to buried pipelines and possible release of untreated wastewater to the river and/or Lake Tahoe relative to existing conditions and the No Project/No Action Alternative. This impact would be* ***less than significant****.*

The existing sewer pipeline crossing under the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, and the upstream crossing at RS 8800 is an exposed concrete encasement. Both of these crossings are inspected by STPUD twice per year (Adams, pers. comm., 2009). Continued normal channel dynamics, particularly any additional channel bed erosion in the future, could further diminish the remaining protective cover and increase the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe. Under Alternative 4, a hard grade control (anchored high-gradient riffle) that increases the thickness and resistance of the channel bed would be installed over these crossings and for some distances upstream and downstream, diminishing the risk of damaging effects during a major flood flow.

A few hundred feet of sewer pipeline are located parallel to and within 25 feet of the eroding streambank on the Upper Truckee River between RS 6500 and RS 5900. Continued normal channel dynamics, particularly any additional channel widening in the future, may undermine and/or expose this section of the sewer pipeline and increase the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe. Under Alternative 4, rock armor streambank protection would be installed along this bank, coupled with upstream and downstream hard grade controls (boulder steps), to stabilize the streambed and prevent undermining of the proposed bank protection. Implementing these measures would reduce the risk of damaging effects on the pipeline during a major flood flow.

Under Alternative 4, the risk of damage to the buried sewer pipelines would be reduced relative to existing conditions and the No Project/No Action Alternative. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-3 (Alt.4) **Long-Term Surface/Soil Erosion within the Study Area.** *Alternative 4 would not involve modifying the topography, soils, vegetation, or drainage on the areas of existing surface erosion caused by prior surface disturbances within Washoe Meadows SP. Existing areas of active erosion would persist. This impact would be* ***less than significant****.*

Similar to Alternatives 1 and 3, no changes to the areas of accelerated soil erosion within Washoe Meadows SP would be expected under Alternative 4. The long-term benefits expected under Alternative 2 would not occur. However, as part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP, with the revised boundaries, which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land. However, additional development in the remaining park area would not occur, because much of the area is within sensitive low-capability lands. State Parks may choose to prepare a general plan for Washoe Meadows SP in the future, if development of new facilities were contemplated; however, this would be a separate action subject to its own environmental review under CEQA.

For a discussion of potentially significant short-term risks of surface/soil erosion within the study area and proposed mitigation measures, see Impact 3.6-1 (Alt. 4) in Section 3.6, “Earth Resources”). This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-4 (Alt.4) **Fine Sediment and Nutrient Retention within the Study Area.** *Alternative 4 would not involve directly modifying the channel capacity, elevation, frequency of overbanking, or area of functional active floodplain, and implementing this alternative would limit future natural geomorphic adjustments to historic disturbances. Implementing Alternative 4 would maintain the existing impaired fine sediment and nutrient retention conditions. This impact would be* ***less than significant****.*

Under Alternative 4, the channel and 36-acre active floodplain in the study area would have only minor modifications through the addition of 0.4 acre of inset floodplain. The channel capacity would remain large, the streambed elevation would remain low, and streambanks would remain high, all of which would limit normal frequent flows (i.e., the 2-year peak flow) from overbanking onto the surrounding former floodplain (now a terrace). The estimated area and location of the active floodplain would remain similar to existing conditions (Exhibit 3.3-14).

Natural geomorphic adjustments along the Upper Truckee River would be restricted by the streambed stabilization and streambank protection measures that would be installed throughout the treatment reaches (RS 1400 to RS 8800). The existing degraded floodplain connectivity to surrounding terrace surfaces would not be allowed to worsen over time. The active floodplain area and potential for frequent overbanking in the study area would be either similar to existing conditions or potentially worse if climate change reduces available streamflow. These factors would reduce the frequency, area, and duration of floodplain inundation. Under Alternative 4, channel widening would be restricted, and no additional inset floodplains would be formed between the high-terrace banks aside from the 0.4 acre to be constructed. Net sediment and nutrient retention would not be substantially improved from existing degraded conditions.

Under Alternative 4, the adverse existing conditions would persist. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-5 (Alt.4) **Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Alternative 4 would involve making minor modifications to the channel bed profile, bank and bed materials, and hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Naturally declining watershed coarse sediment yield would continue, with possible adverse effects on downstream channel erosion and beach erosion adjacent to the river mouth (e.g., at Cove East and Barton Beach), with only a minor decrease in local coarse sediment expected under Alternative 4. In the long term, climate change effects could either exacerbate or counteract present trends. The potential effect could range from worse than the existing degraded condition to a possible improvement. Any determination regarding climate change effects on coarse sediment transport and delivery downstream would be too speculative for a meaningful conclusion. This impact would be* ***less than significant****.*

Alternative 4 would involve stabilizing the streambed to prevent additional incision and to limit knickpoint migration upstream through installation of boulder steps throughout the treatment reaches and anchored high-gradient riffles at the upstream and downstream ends of the project. Implementing this alternative would generally maintain the existing profile, locally raising portions near the boulder steps and AHGRs by up to 1.3 feet, but would not create any abrupt or major breaks in the bed profile. Implementing Alternative 4 would protect the existing high streambanks along the incised channel from excessive erosion through the installation of rock armor and biotechnical streambank protection throughout the treatment reaches. The streambed and streambank protection measures would prevent channel dynamics within the treated reach over the life of the project, reducing sediment loads generated by channel erosion and, therefore, limiting coarse sediment generation within the study area. The channel bed and bank protection measures, although reducing local sediment sources, would not substantially impair transport of sediment from upstream sources through the project reach. Long-term delivery of coarse sediment to downstream reaches and ultimately to the beaches by the river mouth could be diminished proportional to the reduction of coarse sediment sources from eroding streambanks in the study area. However, as under the No Project/No Action Alternative, there are potentially offsetting factors that may result over the long term from climate change, and the net effect on downstream river dynamics and beach erosion is highly uncertain, so any determination regarding the effects on coarse sediment transport and delivery downstream would be speculative.

After thorough investigation, determination on the outcome of Alternative 4 remains too speculative. This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-6 (Alt.4) **Short-Term Risk of Surface Water or Groundwater Degradation during Construction.** *Implementing Alternative 4 would require construction activities along or in the channel of the Upper Truckee River and at the mouths of Angora Creek and the unnamed creek. Although temporary BMPs would be implemented, short-term risks of water quality degradation during construction could occur during summer construction seasons or intervening winters. Implementing Alternative 4 could result in short-term violations to the Basin Plan water quality standards, including turbidity due to construction implementation. This short-term impact would be* ***potentially significant****.*

This impact would be similar to that under Alternative 2 but under Alternative 4, there would be a shorter overall construction period of 2–3 years and a higher percentage of construction disturbance within the existing active floodplain, within the main channel of the Upper Truckee River, and at the mouths of Angora Creek and the unnamed creek (see Alternative 4 construction schedule section in Table 2-8). Only minor areas of floodplain reconstruction and golf course restroom facilities and overflow parking area improvements would be completed "off-channel" (outside of the active channel). Disturbance areas, access routes, and most staging areas would be within the 100-year floodplain, whereas the staging location west of the Upper Truckee River would be outside the 100-year floodplain, similar to Alternative 2.

The project permits and approvals would be the same as under Alternative 2. Conceptual approaches to dewatering have been identified for various elements of Alternative 4 in-channel work (see Chapter 2, "Project Alternatives"), but specific measures have not yet been determined. Efforts would be made to work as quickly as possible to move from initial disturbance through final revegetation throughout, but it is expected that disturbed areas would be exposed to winter conditions between summer construction seasons. Winterization protection could be needed throughout the construction zone, and overwinter use of staging, storage, or access areas would be likely.

All temporary stormwater controls and/or overwinter flood flow protections would be designed and sized to meet the same standards as Alternative 2. Similar to Alternative 2, the probability of a large storm runoff or streamflow event that exceeds temporary capacity occurring during construction would not be reasonably foreseeable.

Based on the conceptual information regarding proposed construction management for Alternative 4, it remains possible that violations of water quality standards could occur, at least for short periods during each summer's activities and/or over each intervening winter and snowmelt season. The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. It is anticipated that State Parks would request an exemption for the potential construction-related violation(s) of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and magnitude would be potentially significant. The surface water and/or groundwater degradation caused by the risk of temporary turbidity increases could potentially be of a magnitude and duration that would impair beneficial uses of the Upper Truckee River, including visible turbidity that impairs aesthetic values or other potential effects on other beneficial uses. Impairment of beneficial uses would be expected to require considerably higher turbidity levels, orders of magnitude above the very low background value for the river. Regardless, the significance conclusion for this environmental document is based on the potential to violate the turbidity standard; therefore, the impact is considered potentially significant.

Mitigation Measure 3.4-6 (Alt. 4): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.4-6 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.4-6 (Alt. 4), residual Impact 3.4-6 (Alt. 4) would remain significant and unavoidable.

IMPACT 3.4-7 (Alt.4)	Short-Term Risk of Surface Water or Groundwater Degradation Following Construction. *Implementing Alternative 4 would require major or prolonged construction activities. Biotechnical streambank treatments and other revegetated areas could be vulnerable during a flood flow within the first few years following construction, but the proposed treatments would not require a period of channel adjustment following construction to meet final design, and the active floodplain would not be enlarged. Implementing Alternative 4 would make changes to the existing condition that would increase short-term risk of water quality degradation following construction in some locations within the study area. Therefore, short-term violations of the turbidity water quality standard in the Basin Plan (i.e., >10 percent over natural background) could result. This short-term impact would be* ***potentially significant****.*

Implementing Alternative 4 would require major or prolonged construction activities, but the proposed treatments would not require a period of channel adjustment following construction to achieve final design. Minor channel adjustments may occur in response to the construction disturbance. However, the treatments would cover the entire potential erosion source area (channel boundaries without new floodplain construction), and in a flood flow situation, the background/natural turbidity would be elevated. Additionally, the type and extent of streambank and streambed treatments would be expected to perform much better than the existing channel conditions, as soon as construction is complete. Therefore, no increased long-term turbidity above the expected channel conditions under existing conditions would be likely. However, a violation of the water quality standards could result, at least for a short period of time. The bank protection measures proposed will limit post construction channel adjustments and therefore the extent and duration of the potential turbidity effects, lessening the potential for impairment of noncontact beneficial uses (aesthetics) compared to Alternatives 2, 3, and 5.

Under Alternative 4, the river system would be expected to respond to an unusually large flood within the first few years after construction differently than Alternative 2, since Alternative 4 would treat the entire reach between hard grade controls (RS 1400 to RS 8800), would not enlarge or reactivate as floodplain portions of the existing terrace that have remained isolated from flow and have accumulated sediment, and would not modify the alignment or create backfilled channels that could be vulnerable to recapture. These differences reduce the potential likelihood and magnitude of effects from a large flood event relative to existing conditions. While the residual effects of an unusually large flood within the first few years of construction would be no worse than under the existing conditions and the No Project/No Action Alternative, a potential for narrative or numeric water quality standards to be violated would exist. This short-term impact would be potentially significant.

The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. State Parks would request an exemption for the potential construction-related violation(s) of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and magnitude would be potentially significant.

Mitigation Measure 3.4-7 (Alt. 4): Adaptively Manage Potential Flood Damage in the Interim Period after Construction.

This mitigation measure is identical to Mitigation Measure 3.4-7B (Alt. 2).

With implementation of Mitigation Measure 3.4-7 (Alt. 4) as described above, Impact 3.4-7 (Alt. 4), short-term risk of surface water or groundwater degradation following construction, would be minimized, because the potential flood damage in the interim period after construction would be adaptively managed. However, the potential for violations of narrative or numerical water quality standard for turbidity, at least for short periods of time, cannot be feasibly eliminated. The residual impact would remain significant and unavoidable.

IMPACT 3.4-8 (Alt.4)	Risks of Surface Water and Groundwater Contamination from Golf Course Operations. *Alternative 4 would not involve modifying the footprint area, configuration, or landscaping management of the existing golf course. Risks of surface water and groundwater contamination would remain similar to those under existing conditions, and operations would continue to be subject to water quality protection regulations, with monitoring, reporting, and response requirements under direct oversight of the Lahontan RWQCB. This impact would be* ***less than significant****.*

Similar to Alternative 1, the physical layout and management practices of the existing landscaped golf course would not be modified under Alternative 4. The area of golf course within SEZ and the limited buffer distances to surface water bodies would remain the same as under Alternative 1. Drainage conditions, use of chemicals, and normal activities posing erosion hazards or risk of accidental spills would continue to be regulated under the same waste discharge permit.

Implementing Alternative 4 would not modify the existing adverse risk posed by the golf course layout and operations under existing conditions and the No Project/No Action Alternative. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.4-1 (Alt.5) **Stream Channel Erosion within the Study Area.** *Alternative 5 would involve making changes to the channel of the Upper Truckee River, the mouth of Angora Creek, and the mouth of the unnamed creek. The changes would offset past geomorphic response to historic disturbances and the undersized bridges within the study area by lengthening the channel, reactivating and constructing more appropriately sized channel sections, improving floodplain connectivity, and removing bridges. These modifications would prompt improved stream function and reduce overall erosion of the streambanks and streambed and would reduce the release of sediment and nutrients that degrade the river and lake water quality relative to existing conditions and the No Project/No Action Alternative. This would be a substantial long-term benefit overall, but localized erosion could increase at the bridge removal sites, downstream of the treated reaches, and/or in the two tributary creeks. This localized risk of increased erosion would be* ***potentially significant****.*

Similar to Alternative 3, potential runoff volumes and peak flows generated within the study area under Alternative 5 would be reduced relative to Alternative 2 and the No Project/No Action Alternative because most of the impervious surface areas would be removed. (See Impacts 3.3-1 [Alt. 5] and 3.3-2 [Alt. 5] in Section 3.3, "Hydrology and Flooding") This would be a beneficial effect on the driving forces of channel erosion.

The same modifications to the existing streambank stabilization features and the same meander reconnections and new channel construction on the Upper Truckee River would occur under Alternative 5 as under Alternatives 2 and 3, producing the same long-term beneficial reduction in channel erosion relative to existing conditions and the No Project/No Action Alternative.

Similar to Alternatives 2 and 3, the raised water surface elevations in the treated reaches would result in a steep transition downstream to the untreated existing Upper Truckee River channel under Alternative 5, which would result in similar potential impacts of increased localized channel and overbank erosion downstream of RS 2000.

The same changes to the alignment, length, and mouth elevation of Angora Creek and the unnamed creek would occur under Alternative 5 as under Alternatives 2 and 3, which would result in similar potential impacts on channel instability in the two tributary creeks.

Similar to Alternatives 2 and 3, all the existing golf course bridges would be removed under Alternative 5, which would result in similar potential impacts of increased localized erosion and sedimentation at the bridge removal sites.

Although the overall long-term channel erosion impact for the treated reaches of the Upper Truckee River under Alternative 5 would be beneficial compared to that under existing conditions and the No Project/No Action Alternative, some portions of the study area could experience increased localized channel erosion. This impact would be potentially significant.

Mitigation Measure 3.4-1A (Alt. 5): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.4-1A (Alt. 2).

Mitigation Measure 3.4-1B (Alt. 5): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

This mitigation measure is identical to Mitigation Measure 3.4-1B (Alt. 2).

Mitigation Measure 3.4-1C (Alt. 5): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-1C (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measures 3.4-1A (Alt. 5) through 3.4-1C (Alt. 5), Impact 3.4-1 (Alt. 5) would be less than significant.

IMPACT 3.4-2 (Alt.5)	**Risk of Channel Erosion Damage to Sewer Pipelines.** *Implementing Alternative 5 would improve existing protective cover over sewer pipelines crossing the Upper Truckee River, but with the new alignment, the channel would be placed within 25 feet of the buried pipeline in two locations. Natural geomorphic adjustments following construction may pose a risk of damage to these portions of the sewer pipelines, as well as the two Angora Creek crossings, potentially releasing untreated wastewater to the river and creek that eventually could reach Lake Tahoe. This impact would be* ***potentially significant****.*

Similar to Alternatives 2 and 3, implementing Alternative 5 would improve protection at two existing buried sewer pipeline crossings under the Upper Truckee River. However, the proposed active channel would be located within 25 feet of the sewer pipeline at two new sites, with additional bank stabilization and lateral migration measures designed to meet an as-yet-undetermined flood event standard. Changes to the mouth of Angora Creek would be made, including bed and bank stabilization designed to meet as-yet-undetermined flood event standards. Proposed grading and excavation in the areas of golf course and floodplain modifications could potentially damage sewer lines of uncertain depth and location within the study area.

Under Alternative 5, the risk of damage to the buried sewer pipelines would be reduced relative to existing conditions and the No Project/No Action Alternative for some locations but increased in other portions of the study area. This impact would be potentially significant.

Mitigation Measure 3.4-2A (Alt. 5): Protect Vulnerable Portions of the Sewer Pipeline up to the 100-Year Flood Event.

This mitigation measure is identical to Mitigation Measure 3.4-2A (Alt. 2).

Mitigation Measure 3.4-2B (Alt. 5): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is identical to Mitigation Measure 3.4-2B (Alt. 2).

Mitigation Measure 3.4-2C (Alt. 5): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-2C (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measures 3.4-2A (Alt. 5) through 3.4-2C (Alt. 5), Impact 3.4-2 (Alt. 5) would be less than significant.

IMPACT 3.4-3 (Alt.5)	**Long-Term Increased Surface/Soil Erosion within the Study Area.** *Alternative 5 would not involve modifying the topography, soils, vegetation, or drainage on the areas of existing surface erosion caused by prior surface disturbances within Washoe Meadows SP. Existing areas of active erosion would persist. This impact would be* ***less than significant****.*

Similar to Alternatives 1, 3, and 4, no direct or indirect changes to the areas of accelerated soil erosion within Washoe Meadows SP would be expected under Alternative 5. Existing adverse conditions would continue. No interim management plan would be prepared as part of Alternative 5, because State Parks would complete a more detailed planning process in the future to evaluate alternative uses of the study area. For a discussion of potentially significant short-term risks of surface/soil erosion within the study area and proposed mitigation measures, see Impact 3.6-1 (Alt. 5) in Section 3.6, "Earth Resources." This impact would be less than significant.

No mitigation is required.

IMPACT 3.4-4 (Alt.5) **Fine Sediment and Nutrient Retention within the Study Area.** *Alternative 5 would involve directly reducing the channel capacity and raising the streambed elevation in several subreaches to increase the frequency of overbanking, enlarge the area of functional active floodplain, and offset past natural geomorphic adjustments to historic disturbances. Implementing Alternative 5 would result in a substantial beneficial improvement in fine sediment and nutrient retention in the study area relative to the existing degraded condition. This effect would be* ***beneficial****.*

Similar to Alternatives 2 and 3, the channel would be lengthened, the bed profile would be raised, bank heights would be lowered, and channel capacity would be reduced under Alternative 5. The same changes in overbank frequency and duration and the enlarged active floodplain anticipated under Alternatives 2 and 3 also would result under Alternative 5. The same beneficial improvements to fine sediment and nutrient retention within the study area and reduction of pollutants released downstream expected under Alternatives 2 and 3 would result under Alternative 5.

Under Alternative 5, fine sediment and nutrient retention in the study area would be substantially improved relative to the existing degraded condition and would result in a beneficial reduction of these pollutants released downstream to the Upper Truckee River and Lake Tahoe. This effect would be beneficial.

No mitigation is required.

IMPACT 3.4-5 (Alt.5) **Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Alternative 5 would involve making major modifications to the channel bed profile, bank and bed materials, and hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Naturally declining watershed coarse sediment yield would continue and potentially would be worsened, particularly during the initial channel adjustment phase, with possible adverse effects on downstream channel erosion and beach erosion adjacent to the river mouth (e.g., at Cove East and Barton Beach). In the long term, climate change effects could either exacerbate or counteract present trends. The potential effect could range from worse than the existing degraded condition to a possible improvement. Any determination regarding climate change effects on coarse sediment transport and delivery downstream would be too speculative for a meaningful conclusion. Over the short term, implementing Alternative 5 would modify coarse sediment transport and deposition within various portions of the study area and likely would decrease coarse sediment delivery to downstream reaches. This impact would be* ***potentially significant****.*

Alternative 5 would involve making the same changes to the streambed profile, would involve making the same changes to streambank and streambed materials, and would be expected to experience the same channel adjustments as Alternatives 2 and 3. Implementing Alternative 5 would result in the same highly uncertain long-term effects on coarse sediment delivery downstream and local beach erosion as Alternatives 2 and 3, so any determination regarding these effects would be speculative. This long-term impact would be less than significant. Implementing this alternative would produce the same short-term reductions in coarse sediment discharged downstream. This short-term impact would be potentially significant.

Mitigation Measure 3.4-5 (Alt. 5): Monitor and Supplement Coarse Sediment Delivery Downstream.

This mitigation measure is identical to Mitigation Measure 3.4-5 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.4-5 (Alt. 5), Impact 3.4-5 (Alt. 5) would be less than significant.

IMPACT 3.4-6 (Alt.5) **Short-Term Risk of Surface Water or Groundwater Degradation during Construction.** *Implementing Alternative 5 would require major or prolonged construction activities along or in the channel of the Upper Truckee River and sections of Angora Creek and the unnamed creek. Although temporary BMPs would be implemented, short-term risks of water quality degradation during construction could occur during each summer construction season or the intervening winters. Implementing Alternative 5 could result in short-term violations to the Basin Plan water quality standards, including turbidity due to construction implementation. This short-term impact would be* ***potentially significant****.*

Similar to Alternatives 2 and 3, Alternative 5 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb the active floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek, with similar phasing (see Table 2-10), access, staging, and storage (see Exhibit 2-13). However, Alternative 5 would not include construction of new golf course facilities west of the Upper Truckee River. Existing golf course facilities would be removed if operating a temporary 9-hole golf course is infeasible. If a 9-hole course is feasible it would be in a similar footprint as Alternative 3 until other uses of the SP and SRA were evaluated as part of a separate planning process.

As under Alternatives 2 and 3, permits and approvals from several entities would need to be obtained under Alternative 5, but the specific measures, performance standards, and enforcement elements required are not yet known. The same general construction management measures and general BMPs would be included as for Alternatives 2 and 3, with similar dewatering approaches and winterization needs. Similar to Alternatives 2 and 3, the probability of a large storm runoff or streamflow event that exceeds temporary capacity occurring during construction would not be reasonably foreseeable under Alternative 5.

Based on the conceptual information regarding proposed construction management under Alternative 5, it remains possible that violations of water quality standards could occur, at least for short periods during each summer's activities and/or over each intervening winter and snowmelt season. The effects could produce a violation of Section 5.2 of the Basin Plan, despite efforts to minimize risks. It is anticipated that State Parks would request an exemption for this potential violation of water quality standards from the Lahontan RWQCB as part of CWA compliance. However, for purposes of this analysis, any violation of any duration and extent would be potentially significantThe surface water and/or groundwater degradation caused by the risk of temporary turbidity increases could potentially be of a magnitude and duration that would impair beneficial uses of the Upper Truckee River, including visible turbidity that impairs aesthetic values or other potential effects on other beneficial uses. Impairment of beneficial uses would be expected to require considerably higher turbidity levels, orders of magnitude above the very low background NTU levels for the river. Regardless, the significance conclusion for this environmental document is based on the potential to violate the turbidity standard; therefore, the impact is potentially significant.

Mitigation Measure 3.4-6 (Alt. 5): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.4-6 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.4-6 (Alt. 5), residual Impact 3.4-6 (Alt. 5) would remain significant and unavoidable.

IMPACT 3.4-7 (Alt.5) **Short-Term Risk of Surface Water or Groundwater Degradation Following Construction.** *Implementing Alternative 5 would require major or prolonged construction activities. Biotechnical streambank treatments and other revegetated areas could be vulnerable during a flood flow within the first few years following construction, and any of the proposed features would require a period of channel adjustment following construction to meet final design. Therefore, implementing Alternative 5 could result in potential short-term turbidity that violates the water quality standard in the Basin Plan (within 10 percent above natual background). This short-term impact would be* ***potentially significant****.*

Alternative 5 would have the same river channel impacts as Alternatives 2 and 3. Potential impacts from overbank and upland areas would be the similar to those under Alternative 3, but the extent of disturbance in the existing golf course (including active and 100-year floodplain) would be larger under Alternative 5. This impact is potentially significant.

Mitigation Measure 3.4-7A (Alt. 5): Minimize Fine Sediment and Organic Material Available for Mobilization.

This mitigation measure is identical to Mitigation Measure 3.4-7A (Alt. 2).

Mitigation Measure 3.4-7B (Alt. 5): Adaptively Manage Potential Flood Damage in the Interim Period after Construction.

This mitigation measure is identical to Mitigation Measure 3.4-7B (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measures 3.4-7A (Alt. 5) and 3.4-7B (Alt. 5), residual Impact 3.4-7 (Alt. 5) would remain significant and unavoidable.

IMPACT 3.4-8 (Alt.5)	Risks of Surface Water and Groundwater Contamination from Golf Course Operations. *Alternative 5 would involve ultimately removing golf course land uses in SEZ and the need for land use buffers along all surface water bodies. Risks to surface water and groundwater contamination from golf course operations would be eliminated, with the exception of the clubhouse, maintenance, and parking facilities. During the future planning process, golf course conditions and operations similar to those under Alternative 3 may exist and produce temporary impacts similar to those of Alternative 3. The long-term effects would be beneficial relative to existing conditions and the No Project/No Action Alternative and all other action alternatives. This impact would be* ***less than significant****.*

Alternative 5 would involve removing the golf course, and all managed golf course landscaping in SEZ would be eliminated, aside from the clubhouse, maintenance, and parking facilities. Managed golf course landscaping would be entirely eliminated along the Upper Truckee River, Angora Creek, and the unnamed creek. However, long term use of the property and potential water quality impacts of those uses would be evaluated in a separate planning process based on input from this EIR/EIS/EIS. It can be expected that long-term irrigation and chemical use would be eliminated with the exception of areas surrounding the clubhouse. Risks related to maintenance vehicle operation along the river and crossing on golf course bridges would be eliminated. Operational risks related to the clubhouse, maintenance, and parking facilities would be similar to those under existing conditions and the No Project/No Action Alternative but could vary based on the interim and long-term uses of the facilities. During the additional planning efforts, it is possible that a temporary 9-hole golf course may remain in place, with similarities to the golf course layout under Alternative 3 but lacking updated or improved irrigation and drainage systems. Additionally, it is expected that the modified short-term and long-term use of the facilities under Alternative 5 would prompt the Lahontan RWQCB to revisit the facility’s waste discharge permit and likely close the existing permit when golf course operations cease. Updating the monitoring and reporting requirements for a new permit for future uses may be necessary.

Implementing Alternative 5 would result in a long-term beneficial reduction in risks posed by the golf course layout and operations relative to those under existing conditions and the No Project/No Action Alternative or Alternatives 2 and 3. It is possible that short-term effects would be similar to those under Alternative 3. This impact would be less than significant.

No mitigation is required.

3.5 BIOLOGICAL RESOURCES (FISHERIES AND AQUATIC RESOURCES, VEGETATION, AND WILDLIFE)

This section describes the terrestrial and aquatic biological resources that are known or have the potential to occur in the study area. Biological resources include common vegetation, wildlife, and fisheries resources; sensitive plant communities; and special-status plant and animal species. Federal, State, and local regulations related to biological resources are summarized. Potential impacts of the proposed alternatives are analyzed, and mitigation measures are provided for those impacts determined to be significant. Consistency with TRPA goals and policies is presented in Section 3.2 Land Use, Table 3.2-1. Cumulative biological impacts are addressed in Section 3.16, "Cumulative Impacts." The project's effects on thresholds are described in Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.5.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has authority over projects that may result in take of a species listed as threatened or endangered under the Federal Endangered Species Act (ESA) of 1973 (Title 50, Part 17 of the Code of Federal Regulations [50 CFR 17]), as amended under the USFWS Mitigation Policy of 1956 (Title 16, Chapter 35, Section 1531 of the United States Code [16 USC 1531 et seq.], as well as those species that are designated by Region 1 of USFWS as species of concern. The ESA defines *take* as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (Public Law 93-205, as amended by Section 3 of Public Law 107-136 [16 USC 1532]). USFWS has also interpreted the definition of "harm" to include habitat modification that could result in take. If a project is likely to result in take of a Federally listed species, either an incidental take permit under ESA Section 10(a) or a Federal interagency consultation under ESA Section 7 is required before the take may occur. Such a permit typically requires various types of mitigation to compensate for or to minimize a take.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, implements domestically a series of international treaties that provide protection for migratory birds. It authorizes the Secretary of the Interior to regulate the taking of migratory birds and provides that it will be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird (16 USC 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. (The current list of species protected by the MBTA can be found in CFR Title 50, Section 10.13 [50 CFR 10.13].)

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act, enacted in 1940 and amended multiple times since, prohibits the taking of bald and golden Eagles without a permit from the Secretary of the Interior. Similar to the ESA, the Bald and Golden Eagle Protection Act defines "take" to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 USC 668-668c). For the purpose of the Act, disturbance that would injure an eagle, decrease productivity, or cause next abandonment, including habitat alterations that could have these results, are considered take and can result in civil or criminal penalties.

Section 404 of the Clean Water Act

Section 404 of the Clean Water Act (CWA) establishes a requirement for a project applicant to obtain a permit before engaging in any activity that involves any discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Under Section 404 of the CWA, the U.S. Army Corps of Engineers (USACE) regulates and issues permits for activities that involve the discharge of dredged or fill materials into waters of the United States. Fills of less than 0.5 acre of nontidal waters of the United States for residential, commercial, or institutional development projects can generally be authorized under USACE's nationwide permit (NWP) program, provided that the project satisfies the terms and conditions of the particular NWP. Fills that do not qualify for a NWP require a letter of permission or an individual permit.

In the Tahoe Basin the USACE has established a regional general permit to authorize certain activities with minimal individual and cumulative impacts on waters of the U.S. that are subject to extensive regulatory review by other agencies, such as the Lahontan Regional Water Quality Control Board and TRPA. Called Regional General Permit 16 (GP 16), this permit can be used to authorize fill for restoration of stream channels and wetlands, among other things. The current term of GP 16 ends September 30, 2010, but it can be renewed by the USACE.

U.S. Forest Service, Lake Tahoe Basin Management Unit

The U.S. Forest Service (USFS) Lake Tahoe Basin Management Unit (LTBMU) manages nearly 80 percent of lands within the Tahoe Basin. The proposed project would not be implemented on LTBMU lands, and USFS has no regulatory authority over the project. However, LTBMU lands are adjacent to and minor lands within the study area, and biological resources there could be affected by project implementation.

Management of the USFS lands adjacent to or near the study area is guided by the LTBMU Forest Plan (USFS 1988), as amended by the *Sierra Nevada Forest Plan Amendment* (USFS 2004). According to the forest plan, USFS will do all of the following, in order of priority:

- protect and enhance water clarity and quality,
- protect threatened and endangered plant and animal species native to the area,
- preserve significant cultural resources,
- achieve air quality standards for health and visibility and prevent the adverse impacts of atmospheric deposition upon water quality,
- maintain viable populations of wildlife,
- achieve diverse vegetation communities, and
- enhance outdoor recreational opportunities.

More specific standards and guidelines for biological and other resources are described in detail in the record of decision for the *Sierra Nevada Forest Plan Amendment*. In addition, the LTBMU maintains a list of plants and animals designated as sensitive by the Regional Forester of USFS Region 5, and a list of management indicator species, that should be addressed when a project may affect LTBMU land.

State

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Section 2050 et seq.) requires that a project proponent obtain a permit from California Department of Fish and Game (CDFG) if the project could take a species that is State-listed as threatened or endangered. Section 2080 of CESA prohibits take of State-listed species without a permit. Under the CESA, *take* is defined as any activity that would directly or indirectly kill an individual of a species. This definition does not include "harm" or "harass," as the Federal definition does. As a result, the threshold for take is higher under the CESA than under the ESA (e.g., habitat modification is not necessarily considered take under the CESA). Under the CESA (Section 2081[b]), a permit is required for take of State-listed species incidental to otherwise lawful activities. Section 2081 authorizes the State to issue an incidental-take permit or to coordinate with USFWS during the Federal process so that the Federal permit will also cover State-listed species. For species that are listed under both the ESA and the CESA, a Federal Section 10(a) or Section 7 permit can suffice for a CESA incidental-take permit, if CDFG finds that the ESA permit is consistent with the requirements of the CESA.

CDFG is also concerned with the protection of species designated as California species of special concern and plants considered rare, threatened, or endangered by the California Native Plant Society (CNPS). These resources are not legally protected by the CESA, but impacts on these resources may be considered significant under the CEQA.

California Fish and Game Code—Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species. CDFG is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. CDFG has informed non-Federal agencies and private parties that they must avoid take of any fully protected species in carrying out projects.

California Fish and Game Code Section 1602—Streambed Alterations

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to regulation by CDFG under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by CDFG, or to use any material from the streambeds, without first notifying CDFG of such activity. *Stream* is defined as a body of water that flows at least periodically or intermittently through a bed or channel with banks. This includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFG's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFG streambed alteration agreement must be obtained for any project that would affect a river, stream, lake, or its adjacent riparian vegetation.

California Fish and Game Code Sections 3503–3503.5—Protection of Bird Nests and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., hawks, owls, eagles, and falcons), including their nests or eggs. Typical violations of these codes include destroying active nests by removing the vegetation in which the nests are located. Disturbance of nesting pairs by nearby project construction that results in the failure of active raptor nests could also violate Section 3503.5.

Section 401 Water Quality Certification/Porter-Cologne Water Quality Control Act

Under Section 401 of the CWA, an applicant for a Section 404 permit must obtain a certificate from the appropriate State agency, stating that the intended dredging or filling activity is consistent with the State's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Resources Control Board to the nine regional water quality control boards (RWQCBs). Each of the RWQCBs must prepare and periodically update a basin plan for water quality control in accordance with the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (California Water Code Section 13000 et seq.). Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to protect wetlands by establishing water quality objectives. Under the Porter-Cologne Act, wetlands and drainages that are considered waters of the United States by USACE are often classified as waters of the State, as well. The applicable water quality standards and control measures for the proposed project are discussed in Section 3.4, "Geomorphology and Water Quality."

Lake Valley State Recreation Area General Plan

The *Lake Valley State Recreation Area General Plan*, established in 1988, sets forth policies regarding the management of natural resources at Lake Valley SRA. The purpose of Lake Valley SRA is to make available an 18-hole golf course and the scenic Upper Truckee River and its environs for the enjoyment and inspiration of the public. The management program includes development and maintenance of a stream management sensitivity zone, a river management plan, a natural resource management element of the golf course management plan for ecological resources, and a water quality monitoring program. The policies call for the management of plant communities in undeveloped areas and along the Upper Truckee River to reestablish normal successional trends and for systematic surveys of rare and endangered plants before any development in the Lake Valley SRA. Policies require that altered natural habitats that are to remain undeveloped will be restored to natural conditions and that an aquatic life habitat enhancement program will be implemented for the Upper Truckee River and Angora Creek within the Lake Valley SRA.

Tahoe Regional Planning Agency

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the Regional Plan. TRPA's *Regional Plan* includes the following documents: environmental threshold carrying capacities (adopted in 1982 and evaluated every 5 years since 1991), Goals and Policies (September 1986 and updated), Regional Transportation Plan—Air Quality Plan (1992), Water Quality Management Plan (1988), Scenic Quality Improvement Program (1989), Plan Area Statements (August 1987 and updated), and Code of Ordinances (May 1987 and updated).

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort lead by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The Conservation Element (Chapter IV) of the TRPA Goals and Policies establishes goals for the preservation, development, utilization, and management of natural resources within the Tahoe Basin (TRPA 2004a). These policies and goals are designed to achieve and maintain adopted environmental threshold carrying capacities and are implemented through the TRPA Code of Ordinances.

The Conservation Element includes 10 subelements that address the range of Lake Tahoe's natural and historical resources. The Vegetation, Wildlife, and Stream Environment Zone (SEZ) Subelements are discussed in this section, and the goals related to each of these subelements are identified below.

Chapter IV of the Goals and Policies identifies the following five goals for vegetation:

- provide for a wide mix and increased diversity of plant communities;
- provide for maintenance and restoration of such unique ecosystems as wetlands, meadows, and other riparian vegetation;
- conserve threatened, endangered, and sensitive plant species and uncommon plant communities;
- provide for and increase the amount of late seral/old-growth stands; and
- retain appropriate stocking level and distribution of snags and coarse woody debris in the region's forests to provide habitat for organisms that depend on such features and to perpetuate natural ecological processes.

The two goals identified for wildlife are as follows:

- maintain suitable habitats for all indigenous species of wildlife without preference to game or nongame species through maintenance of habitat diversity; and
- preserve, enhance, and where feasible, expand habitats essential for threatened, endangered, rare, or sensitive species found in the Basin.

The goal identified for fisheries is:

- improve aquatic habitat essential for the growth, reproduction, and perpetuation of existing and threatened fish resources in the Lake Tahoe basin.

The goal identified for SEZs is:

- provide for the long-term preservation and restoration of stream environment zones.

In addition to these broader goals identified within the Conservation Element, special attainment goals have been developed to further focus management efforts and provide a measure of progress. These attainment goals are defined by the TRPA thresholds. The Conservation Element specifically identifies several attainment goals or thresholds for certain vegetation and wildlife resources. TRPA thresholds are discussed in the "TRPA Environmental Threshold Carrying Capacities" section below.

Code of Ordinances

The applicable provisions of the TRPA Code of Ordinances regarding vegetation, wildlife, and fisheries are summarized below.

Protection and Management of Vegetation

The Code of Ordinances requires the protection and maintenance of all native vegetation types. Chapter 74, "Vegetation Protection and Management," provides for the protection of stream environment zone (SEZ) vegetation, other common vegetation, uncommon vegetation, and sensitive plants in SEZs (TRPA 2004b). TRPA defines an SEZ as an area that owes its biological and physical characteristics to the presence of surface water or groundwater. The term SEZ includes perennial, intermittent, or ephemeral streams; meadows and marshes; and other areas with near-surface water influence within the Tahoe Basin. No project or activity may be implemented within the boundaries of a SEZ except as otherwise permitted for habitat improvement, dispersed recreation, vegetation management, or as provided in Chapter 20, "Land Coverage Standards," of the Code of Ordinances. TRPA can require the preparation and implementation of a remedial vegetation management plan, where the need has been identified, for the purposes of environmental threshold maintenance or attainment. In addition, Chapter 77, "Revegetation," specifies policies for revegetation programs.

Protection of Sensitive and Uncommon Plants

Chapter 75, "Sensitive and Uncommon Plant Protection and Fire Hazard Reduction," of the TRPA Code of Ordinances establishes standards for preserving and managing sensitive plants and uncommon plant communities; these plants and communities are referenced below in "Environmental Threshold Carrying Capacities." Projects and activities that are likely to harm, destroy, or otherwise jeopardize sensitive plants or their habitat must fully mitigate their significant adverse effects. Measures to protect sensitive plants and their habitat include:

- fencing to enclose individual populations or habitat,
- restricting access or intensity of use,
- modifying project design as necessary to avoid adverse impacts,
- dedicating open space to include entire areas of suitable habitat, or
- restoring disturbed habitat.

Tree Removal

TRPA regulates the management of forest resources in the Tahoe Basin to achieve and maintain the environmental thresholds for species and structural diversity, to promote the long-term health of the resources, and to create and maintain suitable habitats for diverse wildlife species. Provisions for tree removal are provided in Chapter 71, "Tree Removal," and Chapters 30, "Design Standards"; 65, "Vegetation Protection During Construction"; 75, "Sensitive and Uncommon Plant Protection and Fire Hazard Reduction"; and 77, "Revegetation," of the TRPA Code of Ordinances, and tree removal requires the review and approval by TRPA (TRPA 2004b).

Project proponents must obtain a tree removal permit from TRPA for cutting of live trees greater than 14 inches diameter at breast height (DBH). (At its November 2007 meeting, the TRPA Governing Board approved an increase in the tree-diameter threshold for a permit from 6 inches to 14 inches; the revised ordinance that reflects this change is presently in effect [Thayer, pers. comm., 2008].) However, trees of any size marked as a fire hazard by a fire protection district or fire department that operates under a memorandum of understanding with TRPA can be removed without a separate tree permit.

Trees greater than 30 inches DBH must be retained, except under circumstances specified in the Code of Ordinances. As stated in Sections 71 and 71.2.B of the TRPA Code of Ordinances:

> Within the non-SEZ urban area, individual trees larger than 30 inches DBH that are healthy and sound will be retained as desirable specimen trees having aesthetic and wildlife value, unless: (1) all reasonable alternatives are not feasible to retain the tree, including reduction of parking areas or modification of the original design; or (2) paragraphs 71.2.A(1), 71.2.A(2), 71.2.A(3), 71.2.A(7), 71.2.A(8), or 71.2.A(9) can be applied.

In addition, trees and vegetation not scheduled to be removed must be protected during construction in accordance with Chapter 65, "Vegetation Protection During Construction," of the TRPA Code of Ordinances.

If a project would result in substantial tree removal (as defined by TRPA Code Section 71.4.I), a tree removal or harvest plan must be prepared by a qualified forester. The required elements of this plan, and TRPA's review process for tree removal plans, are described in Chapter 71 (Section 71.3.B) of the Code of Ordinances.

The Code of Ordinances (Chapter 78) also provides quantitative requirements for snag and coarse woody debris retention and protection by forest type, in terms of size, density, and decay class.

Wildlife

TRPA sets standards for preserving and managing wildlife habitats, with special emphasis on protecting or increasing habitats of special significance, such as deciduous trees, wetlands, meadows, and riparian areas (TRPA Code of Ordinances, Chapter 78). Specific habitats that are protected include riparian areas, wetlands, and SEZs; wildlife movement and migration corridors; important habitat for any species of concern; critical habitat necessary for the survival of any species; nesting habitat for raptors and waterfowl; fawning habitat for deer; and snags and coarse woody debris. In addition, TRPA special-interest species (also referred to as “threshold species”), which are locally important because of rarity or other public interest, and species listed under the ESA or CESA are protected from habitat disturbance by conflicting land uses.

TRPA special-interest wildlife species are northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus anatum*), mule deer (*Odocoileus hemionus*), and waterfowl species.

The TRPA Code of Ordinances includes the following requirements for protection of wildlife movement and migration corridors:

- SEZs adjoining creeks and major drainages that link islands of habitat will be managed, in part, for use by wildlife as movement corridors. Structures, such as bridges, proposed within these movement corridors will be designed to avoid impairment of wildlife movement.

- Projects and activities in the vicinity of deer migration areas will be required to mitigate or avoid significant adverse impacts.

The Code of Ordinances also contains several provisions regarding critical habitat. TRPA defines critical habitat as any element of the overall habitat for any species of concern that, if diminished, could reduce the existing population or impair the stability or viability of the population. This applies also to habitat for special-interest species native to the Tahoe Basin whose breeding populations have been extirpated, but could return or be reintroduced. The Code of Ordinances includes the following critical-habitat provisions:

- No project or activity will cause, or threaten to cause, the loss of any habitat component considered critical to the survival of a particular wildlife species.

- No project or activity will threaten, damage, or destroy nesting habitat of raptors and waterfowl or fawning habitat of deer.

- Wetlands will be preserved and managed for their ecological significance, including their value as nursery habitat to fishes, nesting and resting sites for waterfowl, and as a source of stream recharge, except as permitted pursuant to Chapter 20 of the Code of Ordinances.

- No project or activity will be implemented within the boundaries of a SEZ except as otherwise permitted for habitat improvement, dispersed recreation, vegetation management, or as provided in Chapter 20 of the Code of Ordinances.

Fish Resources

Chapter 79, “Fish Resources,” of the TRPA Code of Ordinances includes provisions for the protection of fish habitat and the enhancement of degraded habitat. For instream habitats, protection provisions include prohibiting stream channel alterations, facilitating fish movement at stream crossings, removing barriers to fish movement, mitigating impacts on fish habitat from development, maintaining instream flows, preventing sediment entry into the stream system, and encouraging native vegetative cover.

The maintenance of essential habitat serves as the fisheries management emphasis for the Conservation Element of TRPA's Goals and Policies (TRPA 2004a). The first goal of the Conservation Element fisheries is to "improve aquatic habitat essential for the growth, reproduction and perpetuation of existing and threatened fish resources in the Lake Tahoe Basin." For streams within the Tahoe Basin, management focus is on the quality and quantity of habitat provided for fish species, including spawning and rearing habitat, food supply, and cover. The Conservation Element identifies the following five attainment policies related to instream fish habitat:

- Development proposals affecting streams, lakes, and adjacent lands will evaluate impacts on the fishery.
- Unnatural blockages and other impediments to fish movement will be prohibited and removed wherever appropriate.
- Habitat improvement projects in streams and lakes will be encouraged.
- Instream flows will be maintained or enhanced.
- State and Federal efforts to reintroduce Lahontan cutthroat trout will be supported.

Environmental Threshold Carrying Capacities

TRPA thresholds have been established for water quality, air quality, scenic resources, soil conservation, fish, vegetation, wildlife, noise, and recreation. TRPA cannot approve projects that would cause a significant adverse effect on a threshold area without appropriate mitigation. As mentioned above, every 5 years TRPA conducts a comprehensive reevaluation to determine whether each threshold is being achieved and/or maintained, creates specific recommendations to address problem areas, and directs general planning efforts for the next 5-year period. The most recent threshold evaluation was completed in 2006 (TRPA 2007). However, changes to the threshold standards that were recommended in the most recent evaluation report have not yet been adopted.

The adopted TRPA thresholds for vegetation, wildlife, and fisheries are listed below, and Table 3.5-1 summarizes the 2006 attainment status for these thresholds (TRPA 2007).

V-1—Common Vegetation

Increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern by using the following indicators:

- provide for the perpetuation of yellow pine forest, red fir forest, subalpine forest, shrub associations, sagebrush scrub, deciduous riparian, meadow associations, wetland associations, cushion plant association;
- maintain at least 4 percent meadow and wetland vegetation, 4 percent deciduous riparian vegetation;
- maintain no more than 25 percent dominant shrub vegetation;
- maintain 15–25 percent of the yellow pine forest in seral stages other than mature;
- maintain 15–25 percent of the red fir forest in seral stages other than mature;
- limit acreage size of new forest openings to no more than 8 acres; and

- ensure that adjacent forest openings are not of the same relative age class or successional stage.

V-2—Uncommon Plant Communities

Provide for the nondegradation of the natural qualities of any plant community that is uncommon to the Tahoe Basin or of exceptional scientific, ecological, or scenic value. This threshold will apply but not be limited to the deep-water plants of Lake Tahoe, Grass Lake (sphagnum fen), Osgood Swamp, the Freel Peak Cushion Plant Community, Hell Hole (sphagnum fen), Upper Truckee Marsh, Taylor Creek Marsh, and Pope Marsh.

V-3—Sensitive Plants

Maintain the following minimum number of population sites for TRPA special-interest plant species: Galena Creek rockcress (*Arabis rigidissima* var. *demota*) (seven sites); long-petaled lewisia (*Lewisia longipetala*) (two sites); Cup Lake draba (*Draba asterophora* var. *macrocarpa*) (two sites); Tahoe draba (*Draba asterophora* var. *asterophora*) (five sites); and Tahoe yellow cress (*Rorippa subumbellata*) (26 sites).

V-4—Late Seral/Old-Growth Ecosystems

Attain and maintain a minimum percentage of 55 percent by area of forested lands within the Tahoe Basin in a late seral or old-growth condition, and distributed across elevation zones. Forested lands within TRPA-designated urban areas are excluded in the calculations for threshold attainment.

W-1—Wildlife Species of Special Interest

Provide a minimum number of population sites for six TRPA special-interest wildlife taxa: northern goshawk (12 sites); osprey (four sites); bald eagle (two winter sites and one nesting site); golden eagle (four sites); peregrine falcon (two sites); and waterfowl (18 sites). Mule deer is also a special-interest species; however, no threshold site number for deer has been specified. Perching and nesting sites of special-interest bird species will not be physically disturbed. TRPA maintains a nondegradation standard within buffer zones (“disturbance zones”) around nest sites of these species. In areas outside existing urban areas, projects or land uses within the disturbance zones will not, directly or indirectly, significantly affect the habitat or cause the displacement or extirpation of the population. Habitat within disturbance zones will not be manipulated in any manner, except for habitat enhancement. The disturbance zone for northern goshawk and bald eagle is a 0.5-mile radius around each nest site; the disturbance zone for osprey, peregrine falcon, and golden eagle is a 0.25-mile radius around each nest site. TRPA has also mapped disturbance zones for wintering bald eagles. Disturbance zones for deer are meadows.

The nondegradation standard in wildlife disturbance zones does not apply to situations where these species select areas in proximity to existing developed parcels.

W-2—Habitats of Special Significance

Apply a nondegradation standard to habitats consisting of deciduous trees, wetlands, and meadows (i.e., riparian, wetland, and meadow habitats) while providing for opportunities to increase the acreage of such riparian associations. This includes but is not limited to preserving existing natural functioning SEZ lands in their natural hydrologic condition, restoring all disturbed SEZ lands in undeveloped, unsubdivided lands, and restoring 25 percent of the SEZ lands that have been identified as disturbed, developed, or subdivided, to attain a 5 percent total increase in the naturally functioning SEZ land.

F-1—Lake Habitat

Apply a nondegradation standard to fish habitat in Lake Tahoe. Achieve the equivalent of 5,948 total acres of excellent (prime) habitat.

F-2—Stream Habitat

Maintain 75 miles of excellent, 105 miles of good, and 38 miles of marginal stream habitat, as indicated by the map on page 76 of the EIS for the Establishment of Environmental Thresholds.

F-3—Instream Flow

Until instream flow standards are established in the Regional Plan to protect fishery values, a nondegradation standard will apply to instream flows.

F-4—Lahontan Cutthroat Trout

Support, in response to justifiable evidence, State and Federal efforts to reintroduce Lahontan cutthroat trout.

Table 3.5-1
TRPA Vegetation and Wildlife Resource Thresholds and Their Attainment Status

TRPA Threshold	2006 Attainment Status
Vegetation	
V-1 Common Vegetation	Nonattainment
V-2 Uncommon Plant Communities	Attainment
V-3 Sensitive Plants	Attainment
V-4 Late Seral/Old-Growth Ecosystems	Nonattainment
Wildlife	
W-1 Special-Interest Species—Northern Goshawk	Nonattainment, Near Attainment
W-1 Special-Interest Species—Osprey	Attainment
W-1 Special-Interest Species—Bald Eagle–Nesting	Nonattainment
W-1 Special-Interest Species—Bald Eagle–Wintering	Nonattainment, Near Attainment
W-1 Special-Interest Species—Golden Eagle	Unknown
W-1 Special-Interest Species—Peregrine Falcon	Unknown
W-1 Special-Interest Species—Waterfowl	Nonattainment
W-1 Special-Interest Species—Deer	Nonattainment
W-2 Habitats of Special Significance	Nonattainment
Fisheries	
F-1—Lake Habitat	Non Attainment, but Near Attainment
F-2—Stream Habitat	Unknown
F-3—Instream Flow	Attainment
F-4—Lahontan Cutthroat Trout	Attainment

Note: TPRA = Tahoe Regional Planning Agency
Source: TRPA 2007

ENVIRONMENTAL SETTING

To evaluate and describe the presence and quality of common and sensitive biological resources in the study area, and to identify potential effects of project implementation on those resources, field surveys of the study area were conducted and the following data sources were reviewed:

- *Riparian Ecosystem Restoration Feasibility Report* for the project reach (River Run Consulting 2006);
- Memoranda and survey reports on wildlife resources from State Parks personnel and contractors (Fields, pers. comms., 2005a, 2005b, 2005c, 2006, 2007a, 2007b, 2008; Wildlife Resource Consultants 2007, 2008a, 2008b);
- Communications with botanist, Adrian Juncosa (consultant who performed vegetation mapping and surveys of Washoe Meadows SP and Lake Valley SRA) (Juncosa, pers. comm., 2006);
- TRPA Code of Ordinances (TRPA 2004a);
- The TRPA *2006 Threshold Evaluation Report*: Chapter 5, “Vegetation”; Chapter 6, “Fisheries”; and Chapter 7, “Wildlife” (TRPA 2007);
- CDFG’s California Natural Diversity Database (CNDDB 2008);
- CNPS’s Electronic Inventory (CNPS 2007);
- *List of Endangered and Threatened Species that May be Affected by Projects in the Lake Tahoe Basin* (USFWS 2008);
- *Wildlife Inventory and Monitoring in the Lake Tahoe Basin, California: Pre-Restoration* (Borgmann and Morrison 2004);
- *Riparian Biological Diversity in the Lake Tahoe Basin* (Manley and Schlesinger 2001);
- *Lake Tahoe Watershed Assessment* (Murphy and Knopp 2000); and
- *Vegetation Monitoring Report for the Upper Truckee River Restoration and Golf Course Relocation Project* (UC Davis Center for Plant Diversity 2007).

Wildlife biologists and botanists conducted reconnaissance-level field surveys in the study area to identify vegetation and wildlife resources. Also, a focused aquatic resource assessment was conducted by aquatic biologists; this assessment included stream habitat typing, snorkel surveys, and bioassessment.

The following sections describe the vegetation types, primary terrestrial and aquatic habitat functions provided, and sensitive biological resources in the study area.

Vegetation

The study area is characterized by a continuum of plant associations and developed land cover types, ranging from golf course, meadow, and riparian areas along the Upper Truckee River to predominantly conifer forest at the highest elevations. Vegetation types in the study area were mapped and described by River Run Consulting in the *Riparian Ecosystem Restoration Feasibility Report* (2006). The vegetation map was verified by botanists during reconnaissance-level field surveys conducted on July 18 and 19, 2006.

The vegetation types, originally described by River Run Consulting (2006), are summarized below and illustrated in Exhibit 3.5-1. The vegetation names are those used by River Run Consulting.

Vegetation in the study area is managed by State Parks for a variety of fuels management, forest health, and riparian/hardwood management goals. For example, as part of the Lake Sector Wildfire Management Plan, State Parks has treated much of the study area for fuels reduction. Additional treatments may be implemented in the future to further reduce fuels in some areas (Walck, pers. comm., 2010). Also, State Parks is currently implementing a Riparian Hardwood Restoration Project funded through a grant from the Reclamation on State Park land, including Washoe Meadows SP and Lake Valley SRA. The Riparian Hardwood Restoration Project involves removal of lodgepole pines along the maintenance road and adjacent to the Upper Truckee River; it should be completed within the study area prior to implementation of the proposed project.

Lodgepole Pine–Dry Type Forest and Lodgepole Pine–Mesic Type Forest

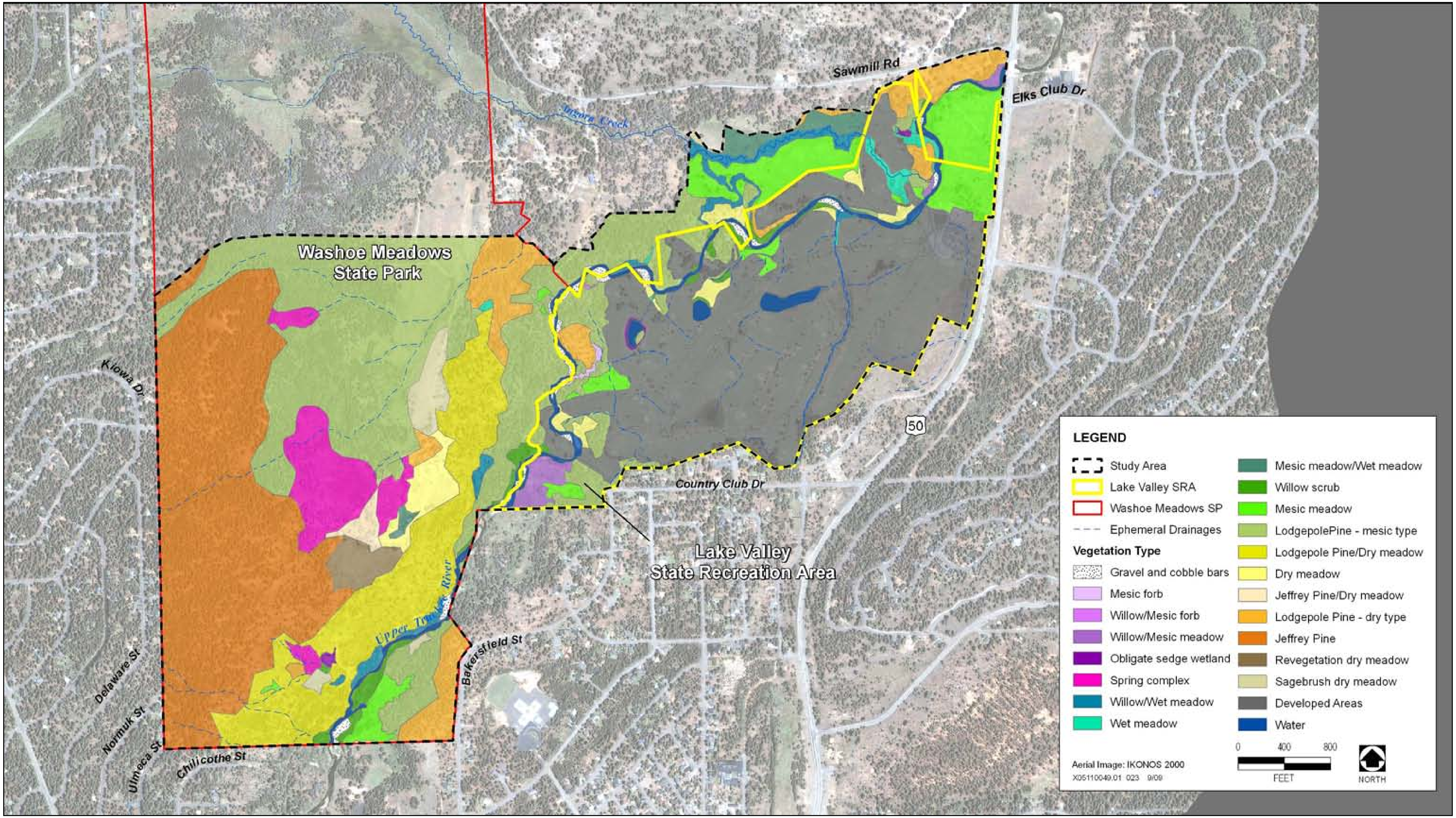
Lodgepole pine forest occupies approximately 185 acres of the study area. This vegetation type is dominated by lodgepole pine (*Pinus contorta* ssp. *murrayana*) with occasional white fir (*Abies concolor*) and Jeffrey pine (*P. jeffreyi*). The forest canopy structure ranges from open to dense. Where the canopy is more open, scattered shrubs are present. The cover and species composition of the herbaceous layer are highly variable. The distinction between lodgepole pine–dry type forest and lodgepole pine–mesic type forest is based on the shrub and herbaceous layers. The shrub layer of lodgepole pine–dry type forest usually is sparse and consists of upland species such as wax currant (*Ribes cereum*), mountain whitethorn (*Ceanothus cordulatus*), and mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*). In lodgepole pine–mesic type forest, the shrub layer may not be present and is limited to riparian species such as willow (*Salix* spp.) that persist along small, abandoned channels. The herbaceous layer of lodgepole pine–dry type forest is dominated by upland grasses such as blue wildrye (*Elymus glaucus*), Kentucky bluegrass (*Poa pratensis*), mountain brome (*Bromus carinatus),* squirreltail (*Elymus elymoides*), and/or needlegrass (*Achnatherum* spp.). Nongrasses, such as Torrey's monkeyflower (*Mimulus torreyi*), Torrey's popcornflower (*Plagiobothrys torreyi* var. *diffusa*), and whiskerbrush (*Linanthus ciliatus*), also are present. The lodgepole pine–mesic type forest has an herbaceous layer dominated by nongrasses, such as fireweed (*Epilobium angustifolium*), cow parsnip (*Heracleum lanatum*), false Solomon's seal (*Smilacina stellata*), meadow-rue (*Thalictrum fendleri*), and corn lily (*Veratrum californicum*).

Jeffrey Pine Forest

Jeffrey pine forest occupies approximately 95 acres of the study area. This vegetation type is present primarily in the western portion of the study area, away from the immediate vicinity of the Upper Truckee River. The forest canopy has variable-age pine trees, some exceeding 30 inches DBH. The majority of the canopy trees are Jeffrey pine; a small portion of the canopy is lodgepole pine and white fir. The boundary between the lodgepole pine–dry type forest (described above) and the Jeffrey pine forest is indistinct. Along the eastern edge of the area mapped as Jeffrey pine forest, the forest has a more significant lodgepole pine component. The subcanopy and understory of Jeffrey pine forest lacks the solid shrub layer that is seen in some other mixed coniferous forest communities in the Tahoe Basin. The Jeffrey pine forest herb layer also is sparse. Species composition of the shrub and herbaceous understory layers is similar to that of the lodgepole pine–dry type forest (described above) and dry meadow (described below).

Willow Scrub

Willow scrub occupies approximately 17 acres of the study area. Willow scrub is present interspersed with mesic and wet meadow vegetation, and on depositional bars. Willow species present in the study area include Lemmon's willow (*Salix lemmonii*), Geyer's willow (*S. geyeriana*), and Pacific willow (*S. lucida* ssp. *lasiandra*). Mountain alder (*Alnus incana* ssp. *tenuifolia*) also is present in willow scrub. Herbaceous species present in willow scrub in the study area are essentially the same as those associated with the mesic forb and wet meadow vegetation types (described below).



Source: California State Parks 2008 (amended by EDAW (now AECOM) Botanists September 2009)

Vegetation Types in the Study Area **Exhibit 3.5-1**

Dry Meadow

Dry meadow occupies approximately 10 acres of the study area. Dry meadow is an herbaceous plant community that is dominated by upland plant species present throughout the study area. Sometimes dry meadow is interspersed with the mesic meadow plant community described below. Scattered trees, primarily lodgepole pine, are present in most areas mapped as dry meadow; however, the habitat and restoration planning value of these areas is primarily meadow, not woodland. Dry-meadow habitat is structurally different from the habitat of other meadow types, with much lower vegetative cover than those types discussed below. Consequently, this community type is highly susceptible to both small-scale surface erosion that results from intense precipitation and large-scale erosion that results when channels become reoriented through previously unflooded areas. The species composition of this community is somewhat variable, depending on its ecological history. Typical dominant species of dry meadow in the study area are squirreltail, mountain brome, Ross' sedge (*Carex rossii*), brown sedge (*C. subfusca*), dwarf lupine (*Lupinus lepidus*), groundsmoke (*Gayophytum* spp.), and needlegrass (*Achnatherum* spp.).

Revegetation Dry Meadow

Revegetation dry meadow is ecologically and structurally similar to dry meadow described above; however, it occurs in areas that have experienced surface disturbance and have been revegetated using species that are not native to the Tahoe Basin. Revegetation dry meadow is present at two locations in the study area and occupies a total of approximately 4.5 acres. During the long time that has passed since these areas were revegetated, they have been colonized by many of the dry-meadow species. However, revegetation dry meadow usually is dominated by nonnative soil stabilization species such as orchard grass (*Dactylis glomerata*), smooth brome (*Bromus inermis*), hard fescue (*Festuca trachyphylla*), and pubescent wheatgrass (*Elytrigia intermedia*).

Sagebrush Dry Meadow

Sagebrush dry meadow occupies approximately 7.3 acres and is present in openings among dry lodgepole and Jeffrey pine forests in the western half of the study area. This sagebrush dry meadow is a mixture of scrub and meadow vegetation, with somewhat lower shrub cover than is typical of the sagebrush dry-meadow vegetation type. Some scattered trees are present in sagebrush dry meadow; however, the habitat values are scrub and meadow rather than woodland. The species composition of sagebrush dry meadow is the same as that described for dry meadow, except that mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is dominant and species that are sometimes found in wetlands such as Kentucky bluegrass and blue wildrye are rare or absent. Other characteristic herbaceous species present in sagebrush dry meadow are dwarf lupine, dusky horkelia (*Horkelia fusca*), and naked buckwheat (*Eriogonum nudum*).

Mesic Forb

Mesic forb vegetation occupies approximately 0.4 acre and is found interspersed with other wetland communities throughout the study area. Mesic forb is a dense, herbaceous, wetland vegetation type, generally with 90–100 percent cover and a relatively diverse assemblage of plants. Typical species present in mesic forb include corn lily, bigleaf lupine (*Lupinus polyphyllus*), meadow-rue, cow parsnip, western polemonium (*Polemonium occidentale*), arrowleaf groundsel (*Senecio triangularis*), false Solomon's seal (*Smilacina stellata*), shooting star (*Dodecatheon jeffreyi*), and large-leaf avens (*Geum macrophyllum*). Depending on soil moisture regime, Kentucky bluegrass, blue wildrye, sedges (*Carex* spp.), and/or rushes (*Juncus* spp.) also may be present as a small component of the total vegetative cover.

Mesic Meadow

Mesic meadow occupies approximately 26.2 acres of the study area, in patches ranging from large openings of many acres to small patches interspersed with willow scrub. Mesic meadow is characterized by grasses, sedges, and rushes and has a relatively high vegetative cover (70–80 percent). Dominants include both upland and wetland species, such as Kentucky bluegrass, yarrow (*Achillea millefolium*), brown sedge (*Carex subfusca*), slender cinquefoil (*Potentilla gracilis*), checkerbloom (*Sidalcea oregana*), meadow beardtongue (*Penstemon rydbergii* var. *oreocharis*), Baltic rush (*Juncus balticus*) and dwarf lupine. Because species composition includes plants with a range of wetland indicator statuses, areas of mesic meadow may be delineated as upland or jurisdictional wetland. Because its dominant plants have fibrous roots as well as rhizomes (creeping surface and subsurface stems bearing leaves or shoots), areas of mesic meadow with high cover are relatively resistant to erosion.

Many occurrences of mesic meadow are actually dewatered wet meadow (described below); however, wetland dominants such as Baltic rush and Nebraska sedge (*Carex nebrascensis*) are abundant, although they are not vigorous, usually flowering little or not at all. An important difference between the two meadow types is that mesic meadow is susceptible to invasion by lodgepole pine, whereas wet meadow is not. In addition, mesic meadow is too dry to allow establishment of vigorous willow clumps. Ecologically, both mesic meadow and wet meadow are similar to willow scrub. Consequently, wet/mesic meadow and willow scrub vegetation usually occur as mixed mosaics.

Wet Meadow

Wet meadow occupies approximately 2.7 acres and is found in small patches throughout the study area. Wet meadow has higher vegetative cover than mesic meadow (95–100 percent). Consequently, this community has the highest erosion resistance of all herbaceous-dominated vegetation types in the study area. Wet meadow that is located away from the river channel is dominated by Nebraska sedge, Baltic rush, checkerbloom, tufted hairgrass (*Deschampsia caespitosa*), and meadow beardtongue. Wet meadow that is adjacent to the river channel is dominated by fowl bluegrass (*Poa palustris*) and Sierra rush (*Juncus nevadensis*). Most wet meadow also includes some proportion of one or more upland species, such as meadow foxtail (*Alopecurus pratensis*), Kentucky bluegrass, yarrow, dandelion (*Taraxacum officinale*), or Lemmon’s yampah (*Perideridia lemmonii*).

Obligate Sedge Wetland

Obligate sedge wetland occupies approximately 0.8 acre and is found in small patches throughout the study area. Obligate sedge wetland occurs primarily in depressions on floodplains or in areas where springs supply perennial surface saturation. Structurally almost identical to wet meadow, this vegetation type features a dense rhizome and root turf; it is distinguished from wet meadow by its much lower species diversity, typically dominated by beaked sedge (*Carex utriculata*), Nebraska sedge, water sedge (*C. aquatilis*), and/or blister sedge (*C. vesicaria*).

Gravel/Cobble Bar

Gravel and cobble bar vegetation is present on recently deposited sediment bars within the study area. The surface of the deposited sediment bar is covered by either cobble-sized particles or sand and gravel. Vegetation on the bars is variable. Species that may be present include Lemmon’s and Geyer’s willows, sedges, fowl bluegrass, Sierra rush, goldenrod (*Solidago canadensis*), dwarf lupine, and common pepperweed (*Lepidium densiflorum*).

Spring Complexes (Including Fens)

Four areas located in the southwest portion of the study area have been mapped as spring complexes. These complexes include: (1) a large undisturbed fen area within Washoe Meadows SP; (2) a groundwater-supported wetland mosaic in the old quarry (located on the quarry high wall and part of the pit floor on the west side of the quarry), adjacent to and east of the large fen; (3) a smaller fen located approximately 1,000 feet north of the large fen; and (4) a spring and associated wetland vegetation at the south end of the park within the study area. The wetland mosaic in the old quarry receives drainage from the large fen and groundwater to the west. This wetland mosaic apparently was created by an old borrow pit cut into the hillside intercepting the water table, which drains into the old pit floor. The wetlands that comprise this complex are distributed on both the quarry high wall and the disturbed pit floor. The disturbed wetlands on the pit floor also receive surface runoff directly from the large fen to the west via a small rivulet. The vegetation type in this mosaic is a stable matrix of obligate sedge wetland, mesic forb, and lodgepole pine vegetation.

Areas mapped as spring complex are composed of wetlands that are supported by groundwater, where the groundwater is sufficiently significant to support distinctive vegetation communities. These areas are of particular biological importance for species diversity because they support a number of plant species that are not found in other wetland types within the study area, including some that are considered special-status species (see discussion of special-status species that follows).

Developed Areas

Golf course areas designated as developed in Exhibit 3.5-1 feature soils or vegetation that have been substantially disturbed or altered such as fairways, greens, golf cart paths, buildings, or gravel and dirt roads. The landscape management approach for this area is discussed further in Chapter 2, “Projects Alternatives”.

Vegetation Mosaics

Several locations in the study area are depicted on the vegetation map as mosaics of multiple units of the previously described vegetation. In the Tahoe Basin, shrub-dominated communities and herbaceous communities commonly occur in tandem. It is neither practical nor useful to map such communities separately. A vegetation mosaic can have different wildlife habitat values than when one of its representative community types occurs alone. Some mixed types represent areas where the vegetation is merely intermediate, for example, Mesic meadow/wet meadow. Others represent stable long-term types that are the result of the normal geomorphic process, such as willow scrub/wet meadow.

Nonnative Invasive Species

An extensive weed survey has not been conducted for the Lake Valley SRA or Washoe Meadows SP but two nonnative species of concern in the Tahoe Basin, cheatgrass (*Bromus tectorum*) and bull thistle (*Cirsium vulgare*), were observed within the study area during vegetation monitoring surveys conducted in 2007 (UC Davis Center for Plant Diversity 2007). Bull thistle is on the Lake Tahoe Basin Weed Coordinating Group’s List B Priority Invasive Weeds of the Tahoe Basin (Lake Tahoe Basin Weed Coordinating Group 2009). These are species that are known to be found in the Tahoe Basin and there are focused efforts to control the spread of existing populations with the goal of eradication. Cheatgrass is mentioned in the Sierra Nevada Forest Plan Amendment as a noxious weed (USFS 2001).

Nonnative, invasive weeds compete with native plant species; their introduction and proliferation in ecosystems can significantly alter the dynamics of native aquatic and terrestrial communities. This conversion can indirectly affect associated wildlife and fish species by changing and often reducing food sources and habitat structure and can lead to competition between native plant species and the weeds, often resulting in loss of native vegetation. The TRPA Goals and Policies specifically prohibit the release of nonnative plant and animal species in the Tahoe Basin because they can invade important wildlife habitats and compete for resources. However, invasive weeds can be introduced inadvertently during grading and construction activities when construction equipment is moved into a site from another area where populations of weeds occur.

WILDLIFE HABITAT FUNCTIONS

The mix of forest, meadow, and riparian-wetland habitat types in the study area support a variety of native wildlife species. These vegetation communities form a mosaic of habitats along hydrologic, elevation, and land use gradients (Exhibit 3.5-1). Annual variability in environmental conditions influences the abundance and distribution of these communities. Many wildlife species use several of the communities as habitat. In addition, the proximity of one community to another may be essential for some species. For example, willow flycatchers (not recently found in the study area, but detected there in 1998) (*Empidonax traillii*) are associated with willow scrub, with areas of open water or saturated soils nearby.

In general, most of the vegetation and aquatic communities likely to be affected by the proposed alternatives can be grouped into the following primary wildlife habitat types: conifer forest (Jeffrey pine and lodgepole pine), willow-riparian, montane meadow, and stream. The following sections summarize the general conditions and functions of these wildlife habitat types. The riparian ecosystem restoration feasibility report prepared by River Run Consulting (2006) has provided additional discussion of terrestrial and aquatic habitat functions of the study area. Special-status species and other habitat functions and resources (e.g., wildlife movement corridors) are addressed in the "Sensitive Biological Resources" section below.

Conifer Forest Habitat (Jeffrey Pine and Lodgepole Pine)

Jeffrey pine covers approximately 95.7 acres in the western portion of the study area. This habitat type has trees in various age and size classes with highly variable structure and density within the study area; trees and snags with cavities are abundant. Some locations have contiguous canopy cover, and others are open with few trees and a dry meadow understory. Lodgepole pine forest is the most abundant habitat in the study area, covering over 120 acres, varying greatly in stand and understory vegetation structure, as described previously.

Conifer forest supports a variety of birds, such as woodpeckers, nuthatches, and kinglets; it also provides suitable roosting habitat for common bat species. This habitat type provides perch sites for raptors such as red-tailed hawk (*Buteo jamaicensis*) and Cooper's hawk (*Accipiter cooperii*) that use meadow areas for foraging. It also provides foraging and nesting for forest raptors. Great-horned owl (*Bubo virginianus*), western screech-owl (*Megascops kennicottii*), and northern saw-whet owl (*Aegolius acadicus*) have been detected in conifer forest in the study area (Fields, pers. comms., 2005b, 2007). Western screech-owl and northern saw-whet owl are both cavity-nesters. Other cavity-nesting species such as tree swallow (*Tachycineta bicolor*), white-breasted nuthatch (*Sitta carolinensis*), hairy woodpecker (*Picoides villosus*), northern flicker (*Colaptes auratus*), and red-breasted sapsucker (*Sphyrpicus ruber*) may nest in this community. Snags and downed logs, common in lodgepole pine forests in the study area, provide structure for wildlife resting, nests, and dens. In some locations near the river, an understory of riparian shrubs is present, providing further habitat structure for wildlife.

Other common bird species observed or likely to occur (based on habitat conditions of conifer forest in the study area) include mountain chickadee (*Poecile gambeli*), red-breasted nuthatch (*Sitta canadensis*), pygmy nuthatch (*Sitta pygmaea*), American robin (*Turdus migratorius*), yellow-rumped warbler (*Dendroica coronata*), Steller's jay (*Cyanocitta stelleri*), western tanager (*Piranga ludoviciana*), chipping sparrow (*Spizella passerina*), dark-eyed junco (*Junco hyemalis*), Brewer's blackbird (*Euphagus cyanocephalus*), and brown-headed cowbird (*Molothrus ater*).

Common small mammal species observed or likely to occur include golden-mantled ground squirrel (*Spermophilus lateralis*), California ground squirrel (*S. beecheyi*), western gray squirrel (*Sciurus griseus*), Douglas' squirrel (*Tamiasciurus douglasii*), vagrant shrew (*Sorex vagrans*), and yellow-pine chipmunk (*Tamias amoenus*). Conifer forest also provides important habitat for larger mammals—raccoon (*Procyon lotor*), coyote (*Canis latrans*), black bear (*Ursus americanus*), and possibly mule deer (*Odocoileus hemionus*). Common amphibians and reptiles likely to inhabit the study area include Pacific chorus frog (*Pseudacris regilla*), sagebrush lizard (*Sceloporus graciosus*), and rubber boa (*Charina bottae*).

Black bears are present in the conifer forests within the study area and the project vicinity. The summer home range of black bears in California varies from a few square miles up to around 20 square miles for some males (Zeiner et al. 1988:294–295). Black bears forage on grasses, insects, carrion, and fruits seasonally, and will eat human refuse if available. They use large downed logs, dense vegetation cover, cavities in trees, or other large hiding places for den sites. Sites on densely covered hillsides tend to be preferred (Zeiner et al. 1988:294–295).

The study area supports summer bear use and potentially winter hibernation dens, although female winter natal dens may be less likely to be located in the study area due to the relatively high levels of recreational disturbance.

Willow-Riparian Habitat

Willow-riparian habitat covers over 17 acres of the study area. This habitat has multiple vegetation types: willow scrub, willow scrub/mesic forb, willow/wet meadow and willow/mesic meadow. Each of these vegetation communities or mosaics provides different wildlife habitat values, depending on hydrology, configuration (e.g., linear riparian vs. meadow), vegetation structure, and species composition; however, they are discussed together here because of their dominance or codominance by willows.

The following discussion provides an overview of riparian habitat functions and values in the Sierra Nevada bioregion, to establish a general reference of potential conditions and factors that influence habitat quality for wildlife. The willow-riparian habitat conditions and functions present in the study area are summarized at the conclusion of this discussion.

Riparian habitats are transitional between an aquatic source (e.g., stream, ponded water, subsurface water) and terrestrial uplands. They are distinguished by unique ecological processes and biological communities, a biophysical linkage between surface or subsurface hydrology and surrounding uplands, sharp ecological gradients, high primary productivity, and biological diversity (Keddy 2000, Brinson et al. 2002, USFS 2001, RHJV 2004). In the Sierra Nevada, important forms of riparian habitat are linear riparian corridors along streams and deciduous shrub components of wet meadows. Specific functions of riparian habitat in this region are listed below (Keddy 2000, Brinson et al. 2002).

- Biological functions:
  - Maintenance of native aquatic and terrestrial vegetation communities
  - Maintenance of movement, foraging, and breeding habitat for a variety of aquatic and terrestrial wildlife species
  - Contribution to local and regional biological diversity
  - Providing habitat for neotropical migrant bird communities
  - Providing habitat links between locations within and across watersheds
- Biogeochemical functions:
  - Primary production
  - Carbon storage
  - Phosphorus, nitrogen, and micronutrient cycling
- Hydrologic and geomorphic functions:
  - Groundwater recharge, surface water storage
  - Sediment and organic matter transport
  - Sediment storage
  - Maintenance of channel and floodplain landforms

Riparian areas provide habitat for aquatic and terrestrial organisms such as aquatic insects, insectivorous birds, aquatic reptiles, amphibians, and mammals. These habitats are among the most productive and species-rich areas in the Sierra Nevada bioregion.

In the Tahoe Basin, riparian habitats support a rich avian and mammal community and contribute a relatively high amount to landscape-level species diversity. For example, of 101 bird species detected by Manley and Schlesinger (2001:113), nearly 40 percent were associated with riparian, meadow, or aquatic habitats.

In California (including the Sierra Nevada), riparian habitats also support a high proportion of neotropical migrant landbird species (i.e., birds that breed in North America and winter in locations such as Mexico and Central and South America), making them among the most important habitats for such species in the western United States (RHJV 2004:16, 70). These areas function as breeding grounds as well as important stopover areas during spring and fall migration.

Species associated with riparian habitats vary considerably in their requirements for riparian vegetation structure, home range or territory sizes, and use of upland habitats. Consequently, more diverse assemblages of wildlife are associated with heterogeneous, wide, and contiguous riparian corridors, bordered by natural upland vegetation. Amphibian and reptile species use a variety of microhabitats, sunny and shaded. For cover, mammal species often require dense vegetation that is close to the ground. Many breeding bird species primarily use early-successional and shrub-dominated vegetation; other bird species prefer late-successional vegetation with taller trees and snags.

Generally, the number of species within riparian and stream corridors increases with the width, continuity, and presence of surface water or saturated soils in the stream channel and adjacent floodplain. Numerous studies in a variety of riparian ecosystems demonstrate this for birds (Keller, Robbins, and Hatfield 1993; Dickson et al. 1995; Sanders and Edge 1998; Kilgo et al. 1998; Rottenborn 1999; Hagar 1999; Hannon et al. 2002; Heath and Ballard 2003). The importance of wide, contiguous corridors may be related to increased habitat heterogeneity in larger corridors, the absence of interior habitats in narrower, fragmented corridors, and the ability of corridors with greater area to support species with large home ranges.

Width and continuity also affect the use of riparian and adjacent uplands as movement corridors. Very narrow corridors, corridors fragmented by development, or corridors lacking dense cover may not be used by some species. In particular, if the riparian and adjacent upland does not meet a species' habitat requirements, it may not be used for dispersal and hence will not provide a suitable corridor that is capable of connecting habitat patches, particularly for smaller, less mobile animals (Noss et al. 1996; Rosenberg, Noon, and Meslow 1997; and Brinson et al. 2002).

Habitat suitability for some riparian-associated bird species is also influenced by hydrologic conditions. For example, important characteristics of meadows and riparian corridors suitable for breeding willow flycatchers in the Sierra Nevada are a high water table that results in standing or slow-moving water, or saturated soils (e.g., "swampy" conditions) during the breeding season; abundant riparian deciduous shrub cover (particularly willow); and riparian shrub structure with moderate to high foliar (leaf) density that is uniform from the ground to the shrub canopy (Sanders and Flett 1989; Bombay 1999; and Green, Bombay, and Morrison 2003).

In the study area, vegetation structure and configuration, species composition, and hydrologic conditions within riparian habitats vary. The riparian corridor width is limited by existing golf course facilities and the continuity of the corridor is broken and disturbed by the golf course and bridges. Some locations support 100-foot-wide willow patches, and willow-dominated habitat generally exists in linear, disconnected, narrow bands along the Upper Truckee River. Also, several meadows with a significant willow component are located along or adjacent to the river's floodplain, and along Angora Creek at the north end of the study area. Although willow-riparian habitat is probably the most biologically productive and diverse in the study area, its distribution, quality, future establishment, and habitat functions are limited by the existing physical and hydrologic conditions of the Upper Truckee River corridor and adjacent land uses, including constraints on habitat distribution and values by the adjacent golf course. The streambed and banks are incised throughout and are severely undercut in some locations. Much of the riparian vegetation grows above the water table, as evidenced by exposed roots along the eroded and incised banks. Also, much of the riparian corridor lacks an herbaceous understory, probably because of inadequate soil moisture, failing banks, large piles of woody debris, and shading from lodgepole pines.

Although the riparian corridor and meadow areas are relatively disturbed and disconnected many important habitat functions and values are provided by the riparian habitats present in the study area. Willow-riparian vegetation provides cover and forage for many species of songbirds. In general, this community provides foraging and nesting habitat for flycatchers, warblers, and sparrows. Riparian-associated species documented in the study area during the breeding season were song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoeniceus*), spotted sandpiper (*Actitis macularius*), yellow warbler (*Dendroica petechia*), warbling vireo (*Vireo gilvus*), and black-headed grosbeak (*Pheucticus melanocephalus*) (Fields, pers. comm., 2006). Yellow warbler is designated as a species of special concern by CDFG and is discussed in "Sensitive Biological Resources" below. Several other riparian-associates were observed by a biologist (in 2008) nearby and likely use portions of the study area during breeding and migration seasons: Wilson's warbler (*Wilsonia pusilla*), orange-crowned warbler (*Vermivora celata*), MacGillivray's warbler (*Oporornis tolmiei*). Other avian species primarily associated with conifer forest habitats, such as mountain chickadee, western wood-pewee (*Contopus sordidulus*), and yellow-rumped warbler, use the willow-dominated communities as foraging habitat. The willows provide especially important foraging habitat during migration, when birds require stopover habitats to rest and forage.

Common amphibian and reptile species known to occur nearby and likely to use riparian communities in the study area are Pacific chorus frog (*Pseudacris regilla*), western terrestrial garter snake (*Thamnophis elegans*), common garter snake (*T. sirtalis*), and Sierra (western aquatic) garter snake (*T. couchii*). Several bat species have been detected in wetland areas near the study area (e.g., Upper Truckee Marsh) and likely forage in the willow scrub–wet meadow communities: hoary bat (*Lasiurus cinereus*), long-eared myotis (*Myotis evotis*), little brown bat (*M. lucifigus*), and Mexican free-tailed bat (*Tadarida brasiliensis*) (Borgmann and Morrison 2004).

Special-status species associated with riparian habitats (e.g., willow flycatcher and yellow warbler) are discussed below in "Sensitive Biological Resources."

Montane Meadow Habitat

Montane meadow habitat covers approximately 56 acres of the study area. This habitat has multiple meadow vegetation types: wet meadow, mesic meadow/wet meadow, mesic meadow, mesic forb, dry meadow, revegetation dry meadow, and sagebrush dry meadow (discussed above). Such habitat is dominated by grasses, forbs, sedges, rushes, or woody shrubs, depending on soil moisture and type, hydrology, and disturbance history. Unlike meadows in willow-riparian habitat, these meadows do not support a substantial riparian deciduous shrub (e.g., willow) component.

Montane meadows provide habitat for many species of ground-nesting birds, support populations of small mammals, and provide foraging opportunities for raptors. Different species use different aspects of these meadows as habitat. Water level modifies this meadow habitat; some species prefer drier areas, and others require moister conditions.

Several mammal species use montane meadow habitat in the study area: long-tailed vole (*Microtus longicauses*), shrew (*Sorex* spp.), deer mouse (*Peromyscus maniculatus*), western jumping mouse (*Zapus princes*), California ground squirrel, coyote, and black bear. During a survey of small mammals conducted in 2008 (Wildlife Resource Consultants 2008b), shrews and western jumping mouse were the most commonly detected small mammal species in the study area. Small mammal populations provide foraging opportunities for raptors such as red-tailed hawk and Cooper's hawk. Amphibian species such as Pacific chorus frog and long-toed salamander (*Ambystoma macrodactylum*) may breed in montane meadow habitats when conditions are wet enough to maintain ponded areas for eggs to develop and metamorphose.

Stream Habitat

The Upper Truckee River flows through the center of the study area. Angora Creek flows across the northern portion of the study area in a previously restored reach through meadow and the Lake Tahoe Golf Course and empties into the Upper Truckee River. In shallow-water areas at stream edges, wading birds such as great blue heron (*Ardea herodias*) and snowy egret (*Egretta thula*) may be present. Shorebird species such as spotted sandpiper use open banks along these stream habitats. When the river floods, fish-free ponds are created, which could provide suitable habitat for long-toed salamander; however, this may not occur frequently due to the incised condition of the channel. Also, the filling of historic channel meanders by spring snow melt could create seasonal pools, which would also provide habitat for amphibians.

Bullfrogs (*Rana catesbeiana*) have been documented in golf course ponds in the study area (McMorrow 2003, Wildlife Resource Consultants 2008a). In the western United States, bullfrog is a nonnative species and serious management concern because it adversely affects ecosystem function by preying on and reducing population viability of native amphibians, snakes, and rodents.

FISHERIES AND AQUATIC RESOURCES

This section presents a summary description of fisheries and aquatic resources in the study area, based on field surveys conducted by biologists, the *Riparian Ecosystem Restoration Feasibility Report* completed for the project (River Run Consulting 2006), and other documents and reports relevant to aquatic resources. Field surveys took place during fall 2006, and included stream habitat typing, snorkel surveys, and bioassessment. Stream habitat typing was conducted throughout the study area, snorkel surveys were conducted in selected deep-water habitats in each of the three main river reaches identified within the study area, and bioassessment surveys were conducted at two sites representative of study reaches 1 and 2. A complete report on survey activities with detailed data and analyses is provided in Appendix G, *Aquatic Resources Technical Memorandum* (EDAW [now AECOM] 2009). Aquatic habitat types, study reaches, and snorkel survey and bioassessment locations are shown in Exhibit 3.5-2.

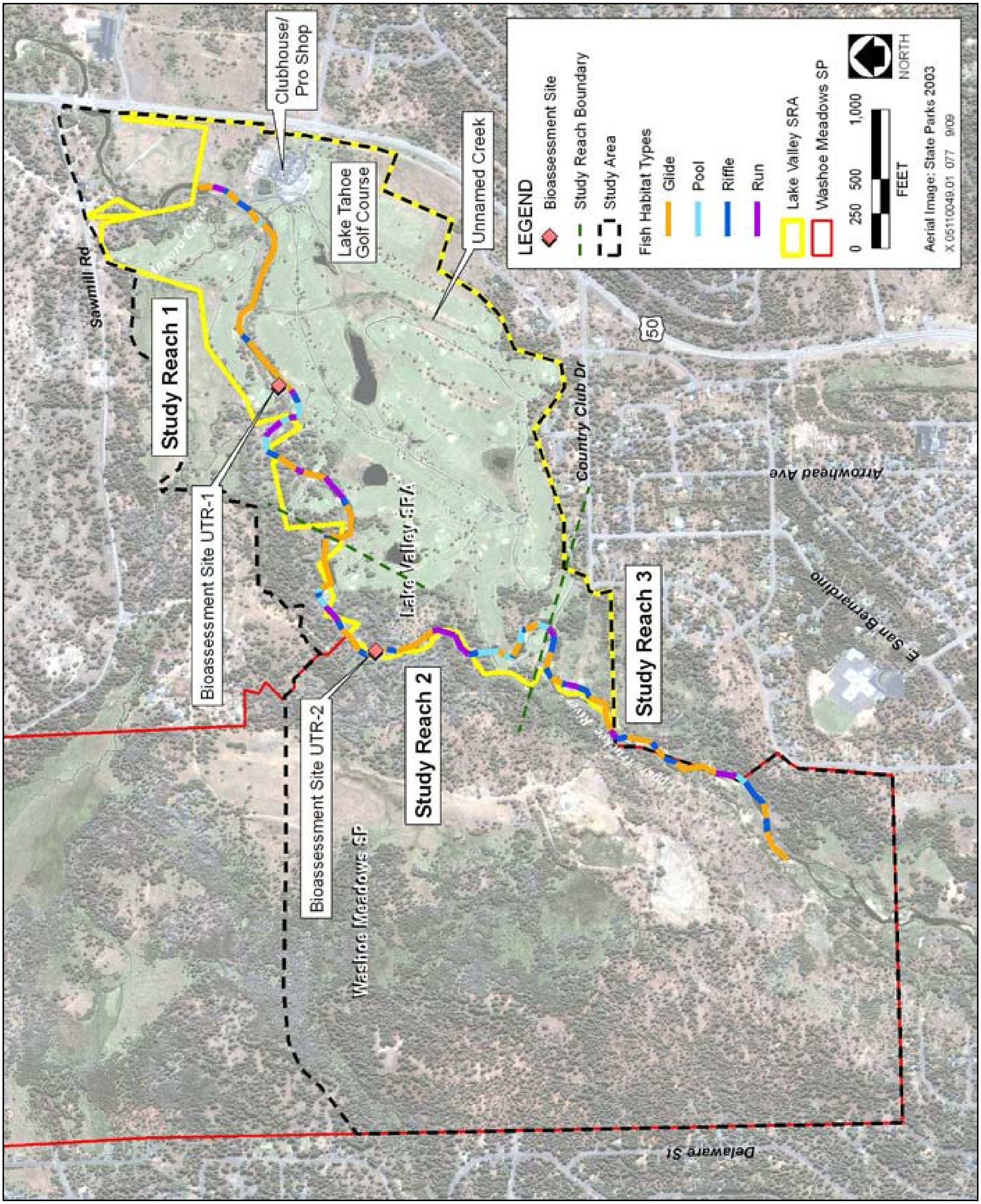
Overview of Aquatic Habitat Function and Use

Fish and aquatic macroinvertebrates use habitats in the Upper Truckee River for adult and juvenile foraging, spawning, egg incubation, larval development, juvenile nursery areas, and migratory corridors. Species use of aquatic habitats for any of these functions may vary in response to a suite of factors, including life stage timing patterns, habitat suitability, and access that may vary daily, seasonally, and annually. The Upper Truckee River's aquatic environment is dynamic, varying in response to the magnitude and duration of seasonal runoff and baseflows, physical habitat structure, and a variety of other physical, chemical and biological processes, including water temperature, dissolved oxygen concentrations, and species interactions (e.g., predator-prey relationships, competition), and forage availability. Although most of the species inhabiting the study area are resident, some species or individuals may only use the area for a specific life stage, such as migration or spawning.

Information regarding species habitat requirements, life history strategies, and habitat usage patterns provides an important foundation for understanding the habitat functions of the river system. Information on habitat functions and use for various species and life stages, therefore, provides a useful framework for assessing existing habitat conditions.

Fisheries Resources

Seven native fish species (Table 3.5-2) are known to occur in the Upper Truckee River (Murphy and Knopp 2000, Moyle 2002, Dill and Cordone 1997, Schlesinger and Romsos 2000). The general abundance of the native fish community has declined considerably since the arrival of the first Euro-Americans in the Tahoe Basin in the 1840s. Several factors are believed to have contributed to the decline or extinction of native fish and the degradation of fish habitat in the Upper Truckee River as well as throughout the greater Tahoe Basin. Logging, water diversions, grazing, commercial harvest, road building, and the introduction of nonnative fish and other aquatic organisms have contributed cumulatively to the change in the Tahoe Basin's fisheries composition and degradation of fish habitat (Murphy and Knopp 2000). Since the Comstock Era (circa 1860), 20 additional species of nonnative fish have been introduced into Tahoe Basin aquatic communities, and at least six (Table 3.5-2) are known to occur in the Upper Truckee River (Murphy and Knopp 2000, Moyle 2002, Dill and Cordone 1997, Schlesinger and Romsos 2000, EDAW [now AECOM] 2009). The variety of nonnative fish introduced into the Tahoe Basin is the result of numerous attempts by State agencies and anglers to establish sustainable commercial and recreational fisheries. The introduction of nonnative fish has greatly influenced the native fish community.



Source: Data compiled by EDAW (now AECOM) in 2009

Fish Habitat and Bioassessment Survey Sites **Exhibit 3.5-2**

Native Fish Species

The Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) is the only salmonid native to lakes and streams in the Tahoe Basin. In the late 1800s and early 1900s, this species supported a commercial fishery in the Tahoe basin. The fishery declined in the 1920s, and it collapsed in the early 1930s (Cordone and Frantz 1966). By 1939, the Lahontan cutthroat trout was extirpated in the Tahoe Basin, from overharvesting, habitat degradation, and the introduction of nonnative fishes (Moyle 2002:292). Numerous attempts have been made to reintroduce this native trout. Between 1956 and 1964, Lahontan cutthroat trout was planted annually in headwater streams of the Upper Truckee River (Cordone and Frantz 1966). In 1970, the species was Federally listed as endangered, but was reclassified as threatened in 1975 (40 *Federal Register* 29864, July 16, 1975), to facilitate its management and allow angling.

Table 3.5-2
Fish Species in the Upper Truckee River

Common Name	Scientific Name	Observed in the Study Area during Fall 2006 Survey
Native Fish Species		
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*	
Mountain whitefish	*Prosopium williamsoni*	
Tahoe sucker	*Catostomus tahoensis*	X
Paiute sculpin	*Cottus beldingi*	
Lahontan speckled dace	*Rhinichthyes osculus robustus*	
Lahontan redside	*Richardsonius egregious*	X
Tui chub	*Gila bicolor*	
Nonnative Fish Species		
Rainbow trout	*Oncorhynchus mykiss*	X
Brown trout	*Salmo trutta*	X
Brook trout	*Salvelinus fontinalis*	
Kokanee salmon	*Oncohynchus nerka*	
Bluegill	*Lepomis macrochirus*	X
Brown bullhead catfish	*Ictalurus nebulosus*	

Source: Moyle 2002, Dill and Cordone 1997, Schlesinger and Romsos 2000, data compiled by EDAW (now AECOM) in 2009

Numerous efforts have been made to restore Lahontan cutthroat trout populations in streams and small lakes, including the upper reaches of the Upper Truckee River. Reintroduction efforts in the Tahoe Basin have been hampered by the presence of nonnative trout (see below), which compete with, predate on, and/or hybridize with Lahontan cutthroat trout (Moyle 2002:292). For reintroduction of Lahontan cutthroat trout to be successful, nonnative salmonids must first be removed.

Large numbers of Lahontan cutthroat trout were stocked into lakes in the Upper Truckee River watershed between 1996 and 2001. In 2001, CDFG curtailed planting all trout (including Lahontan cutthroat trout) in backcountry lakes and streams in the Sierra Nevada above 5,000 feet elevation because of concerns over their effects on native amphibians, particularly the Sierra Nevada yellow-legged frog (*Rana sierrae*) (Knutson, pers. comm., 2005 and Lehr, pers. comm., 2005). Lahontan cutthroat trout are presently confined to headwater tributaries of the Upper Truckee River and are not present in the study area.

The mountain whitefish (*Prosopium williamsoni*) is native to lakes and streams of western North America, including the Tahoe Basin. Adults spawn in the fall or early winter among gravel, cobble, and boulders, in riffles of tributary streams. Mountain whitefish favor stream bottoms and feed mainly on aquatic insect larvae. Their current distribution throughout the Tahoe Basin is poorly documented, and they generally are believed to be less abundant and less widely distributed relative to historic levels. The reason for decline is unclear; construction of dams and predation on whitefish fry by nonnative trout species are believed to be possible causes (Moyle 2002:244-245). Mountain whitefish were not observed in the study area during field surveys.

The Tahoe sucker (*Catostomus tahoensis*) is native to lakes and streams in the Tahoe Basin. This fish may spawn in Lake Tahoe or its tributary streams, including the Upper Truckee River. In streams, spawning generally occurs in runs or areas of small gravel in pools. Juveniles prefer pools and deep runs with abundant cover (Moyle 2002:191–194). Tahoe sucker was observed in the study area during field surveys.

The Paiute sculpin (*Cottus beldingi*) is the only sculpin native to the Upper Truckee River watershed. This species inhabits streams with slight to moderate current and is found in riffle areas among rubble or large gravel. It also occurs in lakes, including Lake Tahoe. Its diet includes a variety of aquatic invertebrates. The Paiute sculpin is an important prey item for some species of trout (Moyle 2002:357–359) and it has been documented in the study area. However, Paiute sculpin were not observed in the study area during field surveys.

The speckled dace (*Rhinichthyes osculus*) is the most widely distributed fish in western North America. Lahontan speckled dace (*R. o. robustus*) occurs throughout streams and lakes in the Tahoe Basin and is the only dace subspecies native to the Upper Truckee River. Lahontan speckled dace may spawn among gravel areas in riffles in tributary streams. In streams, fry (i.e., early life stage, postlarval) speckled dace concentrate in warm shallows, particularly between large rocks or among emergent vegetation. Adults prefer large substrates (i.e., material on the channel bottom; gravel, cobbles, boulders) with interstitial spaces, shallow rocky riffles and runs, and submerged vegetation or tree roots (Moyle 2002:162–163). Speckled dace were not observed in the study area during field surveys.

The Lahontan redside (*Richardsonius egregious*) is native to streams and lakes in the Tahoe Basin, including the Upper Truckee River watershed. Spawning occurs in the littoral zone (less than 3 feet deep) in lakes or among gravel and cobble substrate in tributary streams. In small streams, adults associate with high-velocity water along the stream margin or in backwater areas (Moyle 2002:134–136). Lahontan redsides were observed in the study area during field surveys.

The tui chub (*Gila bicolor*) is native to streams and lakes in the Tahoe Basin. Two subspecies of tui chub have been reported to occur in the Tahoe Basin: the Lahontan lake tui chub (*G. b. pectinifer*) and the Lahontan stream tui chub (*G. b. obesa*). The lake form is a pelagic fish that feeds on zooplankton in the open waters of Lake Tahoe. The stream form is a benthic fish that feeds on bottom invertebrates in Lake Tahoe and tributary streams. The two forms are difficult to distinguish because of slight variations in morphology and are more readily indentified by their different habitat preferences. Both generally spawn over sandy bottoms or at the mouths of tributaries. Larvae of both forms eventually move out of nursery areas and into their respective habitats (Moyle 2002:122–126). No tui chubs, lake nor stream, were observed during field surveys.

Nonnative Fish Species

Rainbow trout (*Oncorhynchus mykiss*) were first introduced into Lake Tahoe in the late 1800s. Large numbers of domestic, hatchery-raised rainbow trout are currently planted annually into Lake Tahoe. Rainbow trout have also been occasionally stocked in an irrigation pond (hole 9 pond) on the golf course. In the recent past, rainbow trout from the hole 9 pond have been transplanted into the Upper Truckee River (with approval by CDFG) before the pond was drained to make repairs. Rainbow trout have the potential to threaten Lahontan cutthroat trout through competition, predation, and hybridization. Rainbow trout were observed in the study area during snorkel surveys.

Brown trout (*Salmo trutta*) were first introduced into eastern North America, and then into California in 1893 (Dill and Cordone 1997:94). This fish likely was introduced into the Tahoe Basin shortly after its first planting in other parts of California. Brown trout are fall spawners and have the potential to threaten cutthroat trout through predation and competition. Brown trout were not observed during field surveys; however, they have been documented within the Upper Truckee River watershed.

Brook trout (*Salvelinus fontinalis*) are native to eastern North America and were first brought to California in 1871 (Dill and Cordone 1997:102–103). They were planted in numerous streams and lakes throughout California. However, the timing of the first introduction of brook trout into the Tahoe Basin is undocumented. Large numbers of brook trout reportedly were planted into Lake Tahoe between 1953 and 1958 (Cordone and Frantz 1968). Brook trout introductions can fundamentally change alpine lake and stream ecosystems. Brook trout have eliminated yellow-legged frogs, other amphibians, and large invertebrates through predation. Brook trout also have been documented to contribute to elimination of native cutthroat trout through competitive interactions (Moyle 2002:292). Brook trout were not observed during field surveys in the study area; however, they have been documented within the Upper Truckee River watershed.

Several warm-water species—bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), and brown bullhead catfish (*Ictalurus nebulosus*)—have been introduced into Lake Tahoe and some tributary streams (Moyle 2002:398, 402; USFS unpublished data). Their influence on the aquatic ecosystem is unknown; however, their introduction likely has had an adverse effect on native fishes. Bluegill was observed during the fall 2006 field surveys in the study area, while largemouth bass, smallmouth bass, and brown bullhead catfish were not.

Aquatic Habitat Factors Affecting Abundance and Distribution

Several key components determine suitability of aquatic habitat for various aquatic organisms and may impose potentially limiting factors. These components (discussed below) include the frequency and diversity of habitat types, substrate conditions, and bank and riparian canopy conditions, and they interact to various degrees and also are influenced by streamflow. Additional information on physical habitat features within the study area is included in Appendix G, *Aquatic Resources Technical Memorandum* (EDAW [now AECOM] 2009).

Habitat Type Diversity

Different habitat types serve a variety of functions for fish and macroinvertebrates. Habitat diversity has important influences on the aquatic community. Habitat types are often categorized by flow relationships. Four flow-related habitats exist within the study area:

- **Riffles—**Riffles are shallow sections in a stream, where water breaks over rocks or other partially submerged organic debris and produces surface agitation. Riffles are typically higher gradient than other habitat types, and substrates in these sections are usually dominated by larger particle sizes (e.g., coarse gravel, cobble, and boulders). Riffles exhibit conditions conducive to spawning for certain fish species, improve water quality (e.g., turbulence increases dissolved oxygen), and often are productive areas for the macroinvertebrate community.

- **Runs—**Runs are swiftly flowing reaches with little surface agitation and no major flow obstructions. They often appear as flooded or fully inundated riffles. Typical substrate in this habitat type consists of gravel, cobble, and boulders. Runs frequently are formed on the downstream end of riffles and provide many of the same functions. They meet varying habitat requirements for different species or different size class individuals.

- **Glides—**Glides are wide, relatively homogenous habitat types with uniform channel bottoms. Flows typically exhibit low to moderate velocities, lacking pronounced turbulence. Substrate usually consists of smaller particle sizes (sand, gravel, and cobble). Glides provide important transitional habitats between riffles, runs, and pools. Glides with adequate cover (in the form of substrate or woody debris, as described below) provide important rearing habitat for juvenile fish species.

- **Pools—**Pools are deep habitat types, formed and maintained by hydraulic forces that create a scouring effect. Pools can be found in various locations, depending on the dominant processes associated with the formation. Pool habitat is important because they provide velocity refugia (i.e., shelter) during high winter and spring flows, and they are an especially supportive habitat during the summer low-flow period as well as during periodic droughts. Adults of many aquatic species, including rainbow trout, mountain whitefish, and Tahoe sucker, rely heavily on pool habitat. Deeper pools with good shelter characteristics provide important habitat (Bjornn and Reiser 1979).

The extent and quality of glide and pool habitats can be greatly influenced by the health of riparian vegetation (see below), which provides important structure and shelter components.

Throughout the study area, habitat type diversity varies longitudinally along the river, with a pattern of decreasing diversity from upstream to downstream. Habitat in Reach 1, the furthest downstream reach, is least diverse in the study area, dominated by long, homogeneous glides with a few deep holes. Reach 2 also includes several long glides; however, these habitats are more frequently broken by small riffles and pools. Reach 3 has the largest relative length of habitat types classified as riffles (see also Exhibit 3.5-2).

Substrate Conditions

Substrate conditions influence production of aquatic invertebrates that are important in the aquatic food web. Many fish species, including salmonids, also rely on relatively loose, clean gravel substrate with low amounts of fine sediments for reproduction. Larger substrate, such as cobbles and boulders, can provide hiding areas and velocity refugia for juveniles of many species. Silt and sand that are present in excessive amounts fill spaces between the larger substrate elements and reduce its ability to support benthic macroinvertebrate production, habitat for spawning, egg incubation, and escape cover (Bjornn and Reiser 1979, Harrington and Born 2000).

Cobble embeddedness can be estimated in habitat surveys by observing the average proportion of individual cobble size substrate that is embedded in finer material. Substrate size class and cobble embeddedness were estimated during bioassessment surveys at two locations in the study area (Reach 1 and Reach 2; see Exhibit 3.5-2). The Reach 2 site exhibited generally larger substrate size particles, and the Reach 1 site was documented to have a higher amount of embeddedness (EDAW [now AECOM] 2009).

Bank and Canopy Conditions

Riparian vegetation on stream banks is intricately linked to the aquatic environment and influences it in many ways (Bjornn and Reiser 1979). Shaded riverine aquatic vegetation and instream tree and shrub debris provide important fish habitat. Such habitat is defined as the nearshore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this cover type are an adjacent bank with natural, eroding substrates; supporting riparian vegetation that either overhangs or protrudes into the water; and water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots, and has variable depths, velocities, and currents. Riparian habitat provides structure and food for fish species. Shade decreases water temperatures, and low, overhanging branches can attract terrestrial insects. As a riparian area matures, the vegetation sloughs off into the river, creating structurally complex habitat consisting of large woody debris that furnishes refugia from predators, creates increased water velocities, and provides habitat for aquatic invertebrates. For these reasons, many fish species are attracted to this habitat.

Bank and canopy conditions were generally assessed throughout the study area and in more detail at each of the bioassessment survey sites. Reach 1 was highly channelized with a thin band of vegetation running throughout most of the reach and golf course turf throughout the adjacent floodplain. Bank stability was classified as vulnerable (approximately 80 percent of both banks) and riprap was present over half the area assessed during the survey. Large woody debris was noted only in a single location. In Reach 2, riparian vegetation was more extensive, with increased canopy, ground cover, and bank stability, but still with local areas bounded by golf course turf and extensive areas of eroding bank and incision. Large woody debris was present in greater abundance in this reach. In Reach 3, improved channel, bank, and canopy conditions were noted, compared to the lower reaches. Reach 3 is only minimally incised.

Streamflow Patterns

Streamflow patterns are important in driving geomorphic processes that, in turn, create, maintain, and/or change aquatic habitats. Pool, riffle, run, and glide habitat types as well as substrate composition are directly influenced by fluvial geomorphic processes and associated streamflow patterns. Streamflow patterns also dictate the abundance and types of organisms present in a system. The flow needs for sustaining fisheries and other aquatic life together with the amount, timing, and variability of flow are important elements of the overall ecosystem function. Salmonid eggs require sufficient flows during the incubation period to prevent egg exposure to freezing or desiccation, and to provide necessary water quality and temperature conditions. Rearing juveniles and adults both require flows necessary to maintain suitable water temperatures and dissolved oxygen concentrations. During the field survey, flows were documented to be 9.9 cubic feet per second (cfs), water temperatures were measured to be 12.8 and 8.3 degrees Celsius, and dissolved oxygen concentrations were measured to be 7.86 and 8.18 milligrams per liter, in reaches 1 and 2, respectively. Additional discussion on streamflows and water quality in the Upper Truckee River is provided in Section 3.3, “Hydrology and Flooding,” and Section 3.4, “Water Quality and Geomorphology.”

Aquatic Macroinvertebrates

Aquatic macroinvertebrates are common and important inhabitants of the aquatic environment in the Upper Truckee River. A general description of taxa, position, and basic functions in aquatic ecosystems and their role as an indicator of stream degradation is presented below, followed by a discussion of aquatic invertebrate populations specific to the study area.

Insects are the main types of aquatic macroinvertebrates typically present and commonly include mayflies (*Ephemeroptera*), stoneflies (*Plecoptera*), caddisflies (*Trichoptera*), and true flies (*Diptera*). Noninsect invertebrates include snails (*Gastropoda*), leeches (*Hirudinea*), worms (*Annelida*), and scuds (*Amphipoda*) (Herbst 2001:2). Interactions among aquatic invertebrates, their physical habitats, and their food resources vary among functional groups. Five functional groups are frequently identified, based on feeding behavior, which is also related to habitat:

- Scrapers are adapted to graze or scrape materials (periphyton or attached algae and its associated microbiota) from mineral and organic substrates.
- Shredders primarily comminute (i.e., grind or shred) large pieces of decomposing vascular plant tissue (greater than 1 millimeter in diameter), along with associated microflora and fauna, feeding directly on living vascular macrophytes or gouging decomposing wood.
- Collectors feed primarily on fine particulate organic matter (less than 1 millimeter in diameter) that is deposited in streams.
- Filterers have specialized anatomical structures (e.g., setae, mouth brushes, fans) or silk and silk-like secretions that act as sieves to remove particulate matter from suspension.
- Predators feed primarily on animal tissue, by either engulfing the prey or piercing the prey and sucking its body contents.

Aquatic invertebrates are essential to the proper ecological function of all types of aquatic systems. Many aquatic invertebrates exploit the physical characteristics of aquatic ecosystems to obtain their food. As consumers at intermediate trophic levels (lower levels of the food web), aquatic invertebrates are influenced by both bottom-up and top-down forces in streams and serve as the conduits by which these effects are propagated. Aquatic invertebrates can have an important influence on nutrient cycles, primary productivity, decomposition, and translocation of materials. Aquatic invertebrates constitute an important source of food for numerous fish, and unless outside energy subsidies are greater than instream food resources for fish, effective fisheries management must account for fish-invertebrate linkages and invertebrate linkages with resources and habitats.

Aquatic macroinvertebrates have been shown to be sensitive and informative indicators of stream ecosystem health and water quality. They have been used for many decades as a monitoring tool, known as bioassessment, to assess degradation or disturbance of aquatic and terrestrial habitats. The principle behind bioassessment is to determine the biological integrity of an affected site by comparing its biotic community to that of a known unaffected or reference site. Aquatic macroinvertebrates are a critical component of bioassessment because they are more diverse, ubiquitous, and abundant than fish. Furthermore, in streams, these organisms are in contact with both the water and the bottom substrate.

Biological metrics used in bioassessment procedures include taxa richness measures, species composition measures, tolerance/intolerance measures, and functional feeding groups. These biological metrics define characteristics of the macroinvertebrate assemblage that may change (increase or decrease) in some predictable way with increased human disturbance and/or ecological restoration. For example, EPT taxa (number of families in the Ephemeroptera [mayfly], Plecoptera [stonefly], and Trichoptera [caddisfly] insect orders) are generally sensitive taxa groups with low tolerance to disturbed or degraded conditions. However, caddisflies in the Hydropsychidae family and mayflies in the Baetidae family tend to be more tolerant of disturbance and/or degradation. General trends in biological metrics associated with disturbance are presented in Table 3.5-3.

Table 3.5-3
Trends in Biological Metrics Associated with Disturbance

Biological Metrics	Response to Disturbance
Richness Measures	
Taxa Richness	Decrease
EPT Taxa	Decrease
Composition Measures	
EPT Index	Decrease
Sensitive EPT Index	Decrease
Percent Hydropsychidae	Increase
Percent Baetidae	Increase
Tolerance/Intolerance Measures	
Tolerance Value	Increase
Percent Intolerant Organisms	Decrease
Percent Tolerant Organisms	Increase
Percent Dominant Taxa	Increase

Table 3.5-3 Trends in Biological Metrics Associated with Disturbance	
Biological Metrics	Response to Disturbance
Trophic Measures	
Percent Collectors	Increase
Percent Filterers	Increase
Percent Scrapers	Increase
Percent Predators	Increase
Percent Shredders	Decrease
Source: Harrington and Born 2000	

Aquatic Macroinvertebrates in the Study Area

Surveys of aquatic macroinvertebrates in the Upper Truckee River watershed were conducted in the lower portion of the Upper Truckee River in 1999 and 2000 (Herbst 2001), and in the study area in 2006 (EDAW [now AECOM] 2009). The survey data from both studies indicate that impairment of aquatic biota in the river worsens downstream. The findings are generally consistent between the two surveys and indicate a simplified channel that lacks habitat diversity and structure.

The data from the identification of the sorted aquatic invertebrates for each sample site (UTR-1 and UTR-2; see Exhibit 3.5-2) were used to generate biological metrics that allow for an assessment of the biological condition of the reach at each sampling location. These biological metrics define a characteristic of the aquatic macroinvertebrate assemblage that may change in some predictable way with increased human disturbance and/or ecological restoration. The biological metrics are classified into four categories: richness measures, composition measures, tolerance/intolerance measures, and trophic measures. These metrics were quantified for each site to characterize the parameter ranges for each portion of the watershed.

Richness Measures

Richness measures include taxa richness and EPT taxa. Richness measures reflect the diversity of the aquatic assemblage where increasing diversity correlates with increasing health of the assemblage and suggests that niche space, habitat, and food sources are adequate to support survival and propagation of particular species. Taxa richness was the same for both reaches sampled with 55 taxa groups found. EPT taxa were sampled throughout both reaches with 20 taxa found in UTR-1 and 26 in UTR-2.

Composition Measures

Composition metrics reflect the relative contribution of the population of individual taxa to the total fauna. Choice of a relevant taxon is based on knowledge of the individual taxa and their associated ecological patterns and environmental requirements, such as those that are environmentally sensitive or a nuisance species. Percent Hydropsychidae and Baetidae (two tolerant families) are regional metrics that have evolved to be particularly useful in California streams. The metric values usually increase as the effects of pollution in the form of fine particulate organic matter and sedimentation increase. Composition measures include EPT index, sensitive EPT index, percent Hydropsychidae, and percent Baetidae. More EPT were found in UTR-2 (26) than in UTR-1 (20) and similarly both the EPT and sensitive EPT indexes were higher for UTR-2. The percentage of Baetid and Hydropsychid taxa sampled ranged from 1-2 percent in both reaches, demonstrating a lack of domination by tolerant EPT taxa.

Tolerance/Intolerance Measures

Tolerance/intolerance measures include the tolerance value, percent intolerant organisms, percent tolerant organisms, and percent dominant taxa. Tolerance/intolerance measures reflect the relative sensitivity of the community to aquatic disturbances. The taxa used are usually pollution tolerant and intolerant, but are generally nonspecific to the type of pollution or stressors. High percentages of intolerant taxa in both reaches demonstrate healthy stream conditions. Both reaches had high values of intolerant taxa sampled with 26.8 percent in UTR-1 and 37.3 percent in UTR-2. Tolerant taxa were less abundant with values of 7.7 percent in UTR-1 and 8.7 percent in UTR-2. Percent dominant taxon was 17.6 percent in UTR-1 and 20.1 percent in UTR-2.

Trophic Measures

Trophic measures include percent collectors-filterers, percent scrapers, percent predators, and percent shredders. Trophic measures (i.e., functional feeding group measures) provide information on the balance of feeding strategies in the aquatic assemblage. The composition of the functional feeding group is a surrogate for complex processes of trophic interaction, production, and availability of food sources. An imbalance of the functional feeding groups can reflect unstable food dynamics and can indicate a stressed condition. Both UTR-1 and UTR-2 were dominated by collector-gatherers and scrapers, with predators being the next most prominent feeding group. UTR-1 had 29.8 percent collector gatherers and 28.8 percent scrapers, and UTR-2 had 33.3 percent collector-gatherers and 29.6 percent scrapers. Although dominated by collectors and scrapers, both UTR-1 and UTR-2 contain diversity in functional feeding groups, demonstrating stream health.

Abundance

Abundance provides a measure of density of individuals collected over a fixed area. Because the abundance of individuals can be dominated by a single taxon and/or tolerant taxa, this measure does not necessarily reflect ecological health, function, or value. Nevertheless, abundance is a useful measure to document increases and/or decreases in the aquatic population over a given area. UTR-1 had a higher abundance per square foot of individuals with 284. UTR-2 had a slightly lower abundance at 241. The relatively high abundance at UTR-1 can likely be attributed to more diverse and favorable substrate conditions, including higher concentrations of boulders and the lack of hardpan substrate.

Additional information on these bioassessment surveys is provided in Appendix G, *Aquatic Resources Technical Memorandum* (EDAW [now AECOM] 2009).

Aquatic mollusks have received special attention due to marked declines throughout North America. The western pearlshell mussel (*Margaritifera falcata*) is known to occur within the lower reaches of the Upper Truckee River with large aggregations occurring near the airport (Entrix 2007). The western pearlshell mussel is known to be a highly sensitive indicator species (Nedeau, Smith, and Stone 2005; CDFG 2008). It is not known if *M. falcata* occurs in the Upper Truckee River within the study area; however, this species could be present based on past surveys conducted downstream (Entrix 2007; Taylor, pers. comm., 2009). No aquatic invasive macroinvertebrates were identified during the 2009 BMI study (EDAW [now AECOM] 2009).

Nonnative Aquatic Invasive Species

Nonnative aquatic invasive species have become a priority for education, prevention, and control in the Tahoe Basin. The draft Lake Tahoe Region Aquatic Invasive Species Management Plan (USACE 2009) was released in 2009; this document details past introductions of aquatic nonnative and invasive species, their current status, and future management strategies to avoid additional introductions and spread of current nonnative invasive populations (USACE 2009). Two invasive nonnative aquatic mussels – quagga mussel (*Dreissena bugensis*) and zebra mussel (*Dreissena polymorpha*) – are of particular concern due to their highly invasive nature and potential to disrupt ecosystem function. The presence and distribution of nonnative aquatic invasive species are not well-documented in the study area.

SENSITIVE BIOLOGICAL RESOURCES

In this analysis sensitive biological resources include those species that receive special protection through the TRPA Code of Ordinances, ESA, CWA, USFS Manual, or local plans, policies, and regulations; or that are otherwise considered sensitive by Federal, State, or local resource conservation agencies and organizations. These resources are addressed in the following sections.

Special-Status Species

Special-status species are plants and animals that are legally protected or otherwise considered sensitive by Federal, State, or local resource conservation agencies and organizations. In this document, special-status species are defined as:

- species listed or proposed for listing as threatened, rare, or endangered under the ESA or CESA;
- species considered as candidates for listing under the ESA or CESA;
- wildlife species identified by CDFG as Species of Special Concern;
- animals fully protected under the California Fish and Game Code;
- species designated as a sensitive, special-interest, or threshold species by TRPA;
- species designated as sensitive by the USFS Regional Forester in Region 5; or
- plants on CNPS List 1B (plants that are rare, threatened, or endangered in California and elsewhere) or List 2 (plants that are rare, threatened, or endangered in California but more common elsewhere) (CNPS 2007).

Federal "species of concern" are no longer designated or recognized by USFWS; therefore, species previously designated as such are not addressed.

Special-Status Plants

A preliminary list of special-status plant species with potential to occur in the study area was initially developed based on a review of Federal, State, and local guidelines:

- the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2007);
- a list of special-status species known to occur within the Echo Lake and eight surrounding U.S. Geological Survey 7.5-minute quadrangles, obtained from the California Natural Diversity Database (CNDDB 2008);
- a list of species designated as sensitive species in the USFS LTBMU (USFS 2005);
- a list of taxa designated by TRPA as sensitive or threshold species (TRPA 2007); and
- species that are Federally listed as endangered or threatened, or candidate species that may be affected by projects in the Tahoe Basin (USFWS 2008).

The initial data review preliminarily identified 23 special-status plant, lichen, and fungi species that could occur in the region. Table 3.5-4 summarizes the potential for occurrence of each special-status plant species that was evaluated during this analysis. Based on a review of existing documentation and discussion with local botanists with extensive experience, 10 of these special-status plant species either have the potential to occur or are known to exist in the study area.

Table 3.5-4
Special-Status Plant Species Evaluated for the
Upper Truckee River Restoration and Golf Course Relocation Project

Common and Scientific Name	Regulatory Status[1]			Habitat and Flowering Period	Potential for Occurrence
	Federal	State	Local/CNPS		
Galena Creek rockcress *Arabis rigidissima* var. *demota*	FSS	–	TRPA CNPS List 1B	Fir–pine–quaking aspen associations, and meadow edges, usually on north-facing slopes and rocky outcrops; 7,021–10,020 ft. Blooms August.	**Not expected to occur.** No suitable forest habitat present in the study area. Closest occurrences are along the north shore of Lake Tahoe.
Upswept moonwort *Botrychium ascendens*	FSS	–	CNPS List 2	Grassy fields and lower montane coniferous forest near springs and creeks; 4,921–7,497 ft. Fertile in August.	**Could occur.** Suitable mesic habitats occur in the study area.
Scalloped moonwort *Botrychium crenulatum*	FSS	–		Bogs and fens, lower montane coniferous forest, meadows and seeps, freshwater marshes and swamps; 4,921–10,761 ft. Fertile July–August.	**Not expected to occur.** No suitable forest habitat in the study area, and elevations of known occurrences exceed those elevations in the study area.
Slender moonwort *Botrychium lineare*	FSS	–	–	Upper montane coniferous forest, often in disturbed areas; 8,530 ft. Fertile period not known.	**Not expected to occur.** No suitable forest habitat in the study area, and elevations of known occurrences exceed those elevations in the study area.
Bolander's candle moss *Bruchia bolanderi*	FSS	–	–	Lower montane coniferous forest in mesic soils; 5,597–8,999 ft. Fertile period not specified.	**Could occur.** Suitable mesic habitats occur in the study area.
Shore sedge *Carex limosa*	–	–	CNPS List 2	Upper montane coniferous forest, lower montane coniferous forest, bogs and fens, meadows and seeps, marshes and swamps (in floating bogs and soggy meadows, often at edges of lakes); 3,697–9,104 ft. Blooms June–August.	**Observed in Study Area.** Observed within the large undisturbed fen area in Washoe Meadows SP in 2003 and 2006.
Tahoe draba *Draba asterophora* var. *asterophora*	FSS	–	TRPA CNPS List 1B	Alpine boulder and rock fell fields, subalpine coniferous forest, on open talus slopes or decomposed granite, outcrops; 8,202–11,499 ft. Blooms July–September.	**Not expected to occur.** No suitable subalpine habitat in the study area, and elevations of known occurrences exceed those elevations in the study area.
Cup Lake draba *Draba asterophora* var. *macrocarpa*	FSS	–	TRPA CNPS List 1B	Subalpine coniferous forest, usually in relatively deep soil in the shade of granitic rocks; 8,202–9,235 ft. Blooms July–August.	**Not expected to occur.** No suitable subalpine habitat in the study area, and elevations of known occurrences exceed those elevations in the study area.

Table 3.5-4
Special-Status Plant Species Evaluated for the
Upper Truckee River Restoration and Golf Course Relocation Project

Common and Scientific Name	Regulatory Status[1]			Habitat and Flowering Period	Potential for Occurrence
	Federal	State	Local/CNPS		
Subalpine fireweed *Epilobium howellii*	FSS	–	–	Subalpine coniferous forest, meadows and seeps; 6,562–8,858 ft. Blooms July–August.	**Not expected to occur.** No occurrences known from the southern side of the Tahoe Basin.
Oregon fireweed *Epilobium oreganum*	–	–	CNPS List 1B	Upper montane coniferous forest, lower montane coniferous forest, in or near streams, bogs, or fens; 1,640–7,349 ft. Blooms June–September.	**Could occur.** Suitable mesic habitats occur in the study area. Only known from the northern end of Lake Tahoe.
Marsh willowherb *Epilobium palustre*	–	–	CNPS List 2	Bogs and fens, meadows, and seeps; 7,218 ft. Blooms July–August.	**Not expected to occur.** In California, known only in the Grass Lake area.
Starved daisy *Erigeron miser*	FSS	–	–	Upper montane coniferous forest in rocky soils; 6,036–8,596 ft. Blooms June–October.	**Not expected to occur.** No suitable coniferous forest habitat present in the study area, and no occurrences known from the southern side of the Tahoe Basin.
Donner Pass buckwheat *Eriogonum umbellatum* var. *torreyanum*	FSS	–	–	Rocky, volcanic substrate in meadows and upper montane coniferous forest. 6,086–8,596 ft. Blooms July–September.	**Not expected to occur.** No volcanic substrate and suitable forest habitat present in the study area.
Short-leaved hulsea *Hulsea brevifolia*	FSS	–	CNPS List 1B	Lower and upper montane coniferous forest often on slate; 4,921–10,499 ft. Blooms May–August.	**Not expected to occur.** No suitable coniferous forest and substrate habitat present in the study area.
Long-petaled lewisia *Lewisia longipetala*	FSS	–	TRPA CNPS List 1B	Alpine boulder and rock field, subalpine coniferous forest; 8,202–9,596 ft. Blooms July–August.	**Not expected to occur.** No suitable subalpine habitat present in the study area, and elevations of known occurrences exceed those elevations in the study area.
Three-ranked hump moss *Meesia triquetra*	FSS	–	CNPS List 2	Bogs and fens, meadows and seeps, upper montane coniferous forest on mesic soil; 4,265–8,202 ft. Fertile period not specified.	**Observed in Study Area.** Observed in the large undisturbed fen in Washoe Meadows SP in 2002 and 2003.
Broad-nerved hump moss *Meesia uliginosa*	FSS	–	CNPS List 2	Bogs and fens, meadows and seeps, upper montane coniferous forest on mesic soil; 4,265–8,202 ft. Fertile period not specified.	**Could occur.** Suitable mesic habitats occur in the study area.

Table 3.5-4
Special-Status Plant Species Evaluated for the
Upper Truckee River Restoration and Golf Course Relocation Project

Common and Scientific Name	Regulatory Status[1]			Habitat and Flowering Period	Potential for Occurrence
	Federal	State	Local/CNPS		
Veined water lichen *Peltigera hydrothyria*	FSS	–	–	Cold, unpolluted streams and springs in coniferous forest. Fertile period not specified.	**Could occur.** Suitable mesic habitats occur in the study area.
Slender-leaved pondweed *Potamogeton filiformis*	–	–	CNPS List 2	Marshes and swamps, clear water of lakes and drainage channels (assorted shallow water); 984–7,579 ft. Blooms May–July.	**Could occur.** Suitable mesic habitats occur in the study area. Known from west side of Lake Tahoe.
Tahoe yellow cress *Rorippa subumbellata*	FC FSS	CE	TRPA	Decomposed granitic beaches 6,217–6,233 ft. Blooms May–September.	**Not expected to occur.** Only known occurrences are along the shores of Lake Tahoe.
Water bulrush *Scirpus subterminalis*	–	–	CNPS List 2	Bogs and fens, marshes and swamps (montane lake margins in shallow water); 2,461–7,661 ft. Blooms July–August.	**Could occur.** Suitable mesic habitats occur in the study area.
Marsh skullcap *Scutellaria galericulata*	–	–	CNPS List 2	Lower montane coniferous forest, meadows and seeps, marshes and swamps; 0–6,890 ft. Blooms June–September.	**Could occur.** Suitable mesic habitats occur in the study area. Large population known to occur along a restored portion of Angora Creek to the north of the study area in Washoe Meadows SP.
Crème-flowered bladderwort *Utricularia ochroleuca*	–	–	CNPS List 2	Meadows and seeps, marshes and swamps (lake margins). 4,691–4,724 ft. Blooms June–July.	**Not expected to occur.** Only known from two populations north of Lake Tahoe.

Notes:
CNPS = California Native Plant Society; ft=feet
[1] Regulatory Status Codes:
Federal:
FC = Federal Candidate for listing
FSS = U.S. Forest Service Sensitive
State (California Department of Fish and Game):
CE = California Endangered

Local:
TRPA = TRPA threshold species
California Native Plant Society Listing Categories:
1B = Plants rare, threatened, or endangered in California and elsewhere
2 = Plants rare, threatened, or endangered in California, but more common elsewhere

Source: Data compiled by EDAW in 2006

Upswept moonwort (*Botrychium ascendens*) is a CNPS List 2 species and is on the USFS Regional Forester's list of sensitive species. This fern is a member of the Adder's tongue family (*Ophioglossaceae*) and exhibits fertile fronds in August. Suitable habitat consists of grassy fields and lower montane coniferous forest near springs and creeks. This species was not observed within the study area during reconnaissance-level habitat surveys in 2006 or vegetation monitoring surveys in 2007.

Bolander's candle moss (*Bruchia bolanderi*), three-ranked hump-moss (*Meesia triquetra*), and broad-nerved hump-moss (*M. uliginosa*) are three mosses on the USFS Regional Forester's list of sensitive species. Bolander's candle moss is found on mesic soils in coniferous forests, and three-ranked hump-moss and broad-nerved hump-moss are found in bogs, fens, and wet meadows. Three-ranked hump-moss has been observed at Washoe Meadows SP in 2002 in the undisturbed spring-fen complex area.

Shore sedge (*Carex limosa*) is a CNPS List 2 species. This perennial herbaceous member of the sedge family (*Cyperaceae*) blooms from June to August and can be found in bogs, fens, meadows, seeps, and other saturated settings. This species has been observed in Washoe Meadows SP in the large undisturbed spring-fen complex area.

Oregon fireweed (*Epilobium oregonese*) is a CNPS List 1B species. This perennial herbaceous member of the evening primrose family (*Onagraceae*) blooms from June to September and is found in very wet bogs, fens, or stream edges. It is often confused with the more common fringed willowherb (*E. ciliatum* ssp. *glandulosum*) and is only known from one occurrence in the Tahoe Basin. This species was not observed within the study area during reconnaissance-level habitat surveys in 2006 or vegetation monitoring surveys in 2007.

Veined water lichen (*Peltigera hydrothyria*), a nonvascular plant species on the USFS Regional Forester's list of sensitive species, is found in cold, unpolluted perennial streams and springs in coniferous forest. This species was not observed within the study area during reconnaissance-level habitat surveys in 2006 or vegetation monitoring surveys in 2007.

Slender-leaved pondweed (*Potamogeton filiformis*) is a CNPS List 2 species in the pondweed family (*Potamogetonaceae*) that blooms May through July. It is a perennial herb, found in marshes, swamps, and clear waters of lakes and drainage channels. This species was not observed within the study area during reconnaissance-level habitat surveys in 2006 or vegetation monitoring surveys in 2007.

Water bulrush (*Scirpus subterminalis*) is a CNPS List 2 species in the sedge family that blooms during the months of July and August. Suitable habitat for this perennial herb consists of bogs, fens, and shallow lake margins. This species was not observed within the study area during reconnaissance-level habitat surveys in 2006 or vegetation monitoring surveys in 2007.

Marsh skullcap (*Scutellaria galericulata*) is a CNPS List 2 species found growing in meadows, seeps, marshes, and swamps in lower montane coniferous forests. It is a perennial herb in the mint family (*Lamiaceae*). A large population was found in a meadow in Washoe Meadows SP in 2003 along a restored stretch of Angora Creek.

The potential for occurrence of these special-status plant species is low in the Jeffrey pine and lodgepole pine forest in the study area because of a lack of suitable habitat there. However, the wetlands throughout the study area could provide suitable habitat for these species.

Special-Status Wildlife and Fish

A preliminary list of special-status wildlife and fish species known or with potential to occur in the study area was developed based on a review of Federal, State, and local guidelines:

- species that are Federally listed as endangered or threatened, or candidate species that may be affected by projects in the Tahoe Basin (USFWS 2008);

- CDFG's *Special Animals* report (CDFG 2008), which includes Federally listed and State-listed taxa, CDFG species of special concern, and other special-status animals;

- a list of special-status species known to occur within the Echo Lake and eight surrounding U.S. Geological Survey 7.5-minute quadrangles obtained from the California Natural Diversity Database (CNDDB 2008);

- a list of species designated as sensitive by the USFS Regional Forester in Region 5 (USFS 2005); and

- a list of taxa designated by TRPA as special-interest or threshold species (TRPA 2007).

The preliminary data review identified 30 special-status wildlife species and two special-status fish species that could occur in or near the study area. Of these 32 species, 19 are not expected to occur or have a low potential to occur, and 13 have a moderate to high likelihood to occur or are known to occur. This determination was based primarily on the types, extent, and quality of habitats in the study area; the proximity of the study area to known extant occurrences of the species; and the regional distribution and abundance of the species. Occurrence information for some species was based primarily on results of surveys conducted by State Parks biologists and biological consultants.

Table 3.5-5 summarizes the potential for occurrence of each special-status fish and wildlife species that was evaluated during this analysis. Species with a moderate to high potential to occur or that are known to occur in the study area are described below.

Bald Eagle

Bald eagle is listed as endangered under CESA, designated as a sensitive species by USFS, and designated as a special-interest species by TRPA; it also is fully protected under the California Fish and Game Code. Effective August 8, 2007, bald eagle was removed from the Federal list under the ESA by USFWS because of population recovery throughout most of its range. Bald eagle is still Federally protected by USFWS under the Bald and Golden Eagle Protection Act.

Bald eagles require large bodies of water or free-flowing streams with abundant fish and adjacent snags or other perches for hunting. They generally nest in undisturbed coniferous forests, usually within a mile of a lake or reservoir. Bald eagle habitat typically consists of several components, most significantly, proximity to large bodies of water and wetlands associated with lakes, mature coniferous stands with presence of dominant trees, and adequate protection from human disturbance.

Bald eagles are known to nest within the Tahoe Basin, including Emerald Bay and Marlette Lake (USFS 2000). Bald eagles do not nest in or adjacent to the study area; however, they could forage or perch there throughout the year.

Willow Flycatcher

Three subspecies of willow flycatcher occur in the Sierra Nevada (*E. t. brewsteri*, *E. t. adastus*, and *E. t. extimus*). The Tahoe Basin is within the breeding range of *E. t. adastus*. Willow flycatcher (all subspecies) is designated as sensitive by the Regional Forester of USFS Region 5 and listed as endangered under the CESA; additionally, *E. t. extimus* (southwestern willow flycatcher) is Federally listed as endangered under the ESA. Willow flycatcher was identified in the notice of intent for the *Sierra Nevada Forest Plan Amendment* as one of seven aquatic, riparian, and meadow-dependent vertebrate species at risk in the Sierra Nevada bioregion. This species is recognized by USFS Region 5 as the highest priority landbird species in the Sierra Nevada bioregion and is considered to have the highest likelihood of being extirpated from the Sierra Nevada in the near future.

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
Fish					
Lahontan lake tui chub *Gila bicolor pectinifer*	FSS			Pelagic fish that feed on zooplankton in the open water of Lake Tahoe.	**Not expected to occur.** Not known nor expected to occur outside of Lake Tahoe.
Lahontan cutthroat trout *Oncorhynchus clarki hanshawi*	FT			Only salmonid native to lakes and streams in the Tahoe Basin.	**Not expected to occur.** Introduced populations are confined to headwater streams and lakes of the Upper Truckee River watershed. Not known nor expected to occur in the study area.
Amphibians					
Yosemite toad *Bufo canarus*	FC	SC		Endemic California toad found in wet meadows between 4,000 and 12,000 feet in the Sierra Nevada from Alpine County south to Fresno County.	**Not expected to occur**. The study area is outside the known range of this species.
Mount Lyell salamander *Hydromantes platycephalus*		SC		Isolated populations occur in the Sierra Nevada, from Sierra County south to Tulare County, at approximately 4,000–12,000 feet elevation. Associated with large rock outcrops in mixed conifer, red fir, lodgepole pine, and subalpine habitats. Individuals usually found on the ground surface, in areas of open water in the form of seeps, drips, or spray.	**Not expected to occur.** Suitable habitat is not present.
Northern leopard frog *Rana pipiens*	FSS	SC		Usually occurs in permanent water with abundant aquatic vegetation. Associated with wet meadows, marshes, slow-moving streams, bogs, ponds, potholes, and reservoirs.	**Not expected to occur.** Suitable habitat may be present in the study area. However, no documented occurrences are available for the study area.
Sierra Nevada yellow-legged frog *Rana sierrae*	FC, FSS	SC		Occurs in upper elevation lakes, ponds, bogs, and slow-moving alpine streams. Most Sierra Nevada populations are found between 6,000–12,000 feet elevation. Almost always found within 3.280853 feet of water, and associated with montane riparian habitats in lodgepole pine, ponderosa pine, Jeffrey pine, sugar pine, white fir, whitebark pine, and wet meadow	**Low potential to occur.** Several records show this species to be located near the study area in Desolation Wilderness. However, suitable habitat is not known to occur in the study area (McMorrow 2003) because of hydrologic conditions, presence of predators (e.g., bullfrogs, nonnative trout), and disturbed aquatic habitat. In

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
				vegetation types. Alpine lakes inhabited by mountain yellow-legged frogs generally have grassy or muddy margin habitat, although below treeline sandy and rocky shores may be preferred. Suitable stream habitat can be highly variable, from high gradient streams with plunge pools and waterfalls, to low gradient sections through alpine meadows. Low-gradient streams are preferred because breeding and tadpole development cannot occur in streams with fast-moving water. Small streams are generally unoccupied and have no potential breeding locations because of the lack of depth for overwintering and refuge. Although Sierra Nevada yellow-legged frogs have been observed successfully breeding in shallow locations less than 7 feet deep, typically depth is an important factor for breeding locations since adults and larvae require overwintering habitat. For up to 9 months, adults and larvae will live/hibernate below ice, or in nonfrozen portions of ponds or lakes, so adequate depth (greater than 2 m) is necessary to avoid having the pond or lake freeze through.	2008, yellow-legged frog surveys were conducted in the study area (Wildlife Resource Consultants 2008a); no yellow-legged frogs were observed.
Birds					
Northern goshawk *Accipiter gentilis*	FSS	SC	SI	In the Sierra Nevada, this species generally requires mature conifer forests with large trees, snags, downed logs, dense canopy cover, and open understories for nesting; aspen stands also are used for nesting. Foraging habitat includes forests with dense to moderately open overstories and open understories interspersed with meadows, brush patches, riparian areas, or other natural or artificial openings. Goshawks reuse old nest structures and maintain alternate	**Moderate potential to occur (foraging).** Preliminary surveys for goshawk were initiated by State Parks in 2007; full protocol surveys were initiated in 2008. No goshawks have been detected (Fields, pers. comm. 2008). Goshawks have been observed foraging outside the study area, in the northern portion of Washoe Meadows SP, near Angora Creek (River Run Consulting 2006).

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
				nest sites.	A small amount of suitable habitat is located in the study area (Fields, pers. comms., 2007b, 2008); however, northern goshawk has not been detected there. Conifer forest in the study area is more likely to function as foraging habitat than nesting habitat because of forest structure and disturbance levels. The lack of substantial area of suitable nesting habitat and high disturbance levels in the surrounding area [e.g., residential, recreation, and commercial development] result in a low potential for this species to nest in the study area. Before the Angora fire (2007), the nearest goshawk territory (and USFS protected activity center [PAC]) was located approximately 0.9 mile west of the study area, in the existing burn area. Presently, the nearest territories are approximately 0.6 mile (Seneca Pond), 1.4 miles (Lower Saxon Creek), and 1.8 miles (Tahoe Mountain) away from the study area. The Seneca Pond PAC was recently established by USFS to replace the PAC lost in the 2007 Angora fire. Goshawks were detected in this new PAC in 2008.
Golden eagle *Aquila chrysaetos*		FP	SI	Mountains and foothills throughout California. Nest on cliffs and escarpments or in tall trees.	**Low potential to occur**. Suitable nesting habitat is not present in the study area. A failed nest was located in 2009 near Angora Peak, 2-3 miles west of the study area (Lyon, pers comm., 2010). Due to disturbance levels and habitat quality in the study area, and higher quality habitat outside the study area, golden eagle is not expected to nest or regularly forage in the study area.

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Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
Long-eared owl *Asio otus*		SC		Found in a variety of habitat types throughout its range. Nest in woodland, forest, and open settings (e.g., grassland, shrub-steppe, and desert). Occupy wooded and nonwooded areas that support relatively dense vegetation (e.g., trees, shrubs) adjacent to or within larger open areas such as grasslands or meadows (i.e., habitat edges) (Bloom 1994; Marks, Evans, and Holt 1994). This species also has been documented breeding in contiguous conifer forest habitat with heavy mistletoe infestation (Bull, Wright, and Henjum 1989). Trees and shrubs used for nesting and roosting include oaks, willows, cottonwoods, conifers, and junipers (Marks, Evans, and Holt 1994).	**Observed in the Study Area.** In 2006, this species was detected in conifer forest near the restored quarry on the west side of the study area by State Park biologists during owl surveys (Fields, pers. comm., 2007a). A possible long-eared owl detection was also made in 2007 (Fields, pers. comm., 2009). Breeding status in the study area is unknown.
Northern harrier *Circus cyaneus*		SC		Found in a variety of open grassland, wetland, and agricultural habitats. Open wetland habitats used for breeding include marshy meadows, wet and lightly grazed pastures, and freshwater and brackish marshes. Breeding habitat also includes dry upland habitats, such as grassland, cropland, drained marshland, and shrub-steppe in cold deserts. Winters throughout California where suitable habitat occurs. Wintering habitat includes open areas dominated by herbaceous vegetation, such as grassland, pastures, cropland, coastal sand dunes, brackish and freshwater marshes, and estuaries (Grinnell and Miller 1944, Martin 1987, MacWhirter and Bildstein 1996).	**Low potential to occur.** This species has not been documented in the study area, but it occurs approximately 4 miles away in the Upper Truckee Marsh. Larger meadows in the study area that sustain high vegetation cover (e.g., mesic meadow) could provide suitable habitat for northern harrier. However, northern harriers typically nest in areas that remain undisturbed during the nesting season. The level of recreational activity in the study area throughout the summer months limit its suitability for nesting.
Olive-sided flycatcher *Contopus cooperi*		SC		Summer resident and migrant that breeds primarily in late-succession conifer forest with open canopy. Species prefers to forage near forest openings or edges.	**Observed in the Study Area.** Known to occur in open canopy conifer forests within the Tahoe Basin, and was observed within the study area in 2006 (Fields, pers. comm., 2006). Species is not uncommon in the Tahoe Basin.

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Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
Bank swallow *Riparia riparia*		SE		Nests in fine-textured or sandy banks or cliffs along rivers, streams, ponds, or lakes. Typically nests in colonies.	**Not expected to occur.** Although bank habitat is present in the study area, the Tahoe Basin is not within the current breeding range of bank swallow (see Garrison 1998). The only documented records are from the Tahoe Keys area in 1962 (10 birds) and 1976 (one bird) (CNDDB 2008). Species was not detected during a focused survey in July 2009, or during several other avian surveys along the Upper Truckee River in the study area.
Yellow warbler *Dendroica petechia*		SC		In the Sierra Nevada, yellow warbler typically breed in wet areas with dense riparian vegetation. Breeding habitats primarily include willow patches in montane meadows, and riparian scrub and woodland dominated by willow, cottonwood, aspen, or alder with dense understory cover. Localized breeding has been documented in more xeric sites including chaparral, wild rose (*Rosa* spp.) thickets, and young conifer stands (Siegel and DeSante 1999, RHJV 2004).	**Observed in the Study Area**. Yellow warblers were detected in 2005, 2006, and 2007 during avian surveys conducted by State Parks biologists (Fields, pers. comm., 2005b, 2007a, 2009), in willow-dominated habitat along the Upper Truckee River in the study area.
Willow flycatcher *Empidonax traillii*	FSS	SE		In the Sierra Nevada, suitable habitat typically consists of montane meadows that support riparian deciduous shrubs (particularly willows) and remain wet through the nesting season (i.e., midsummer). Important characteristics of suitable meadows include a high water table that results in standing or slow-moving water, or saturated soils (e.g., “swampy” conditions) during the breeding season; abundant riparian deciduous shrub cover (particularly willow); and riparian shrub structure with moderate to high foliar density that is uniform from the ground to the shrub canopy. Most breeding occurrences are in	**Moderate potential to occur.** Suitable breeding habitat for willow flycatcher is limited in the study area, primarily because of the channel morphology, hydrology, and willow conditions. Potential habitat was mapped by River Run Consulting (River Run Consulting 2006). In 1998, a willow flycatcher detection was made in the study area (Fields, pers. comm., 2005a); however, nesting has not been documented. Surveys coordinated by State Parks in 2001, 2002, and 2007 did not detect willow flycatchers (Fields, pers. comm., 2005a, 2007b; Wildlife Resource Consultants 2007). In

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
				meadows larger than 19 acres, but the average size of occupied meadows is approximately 80 acres. Although less common in the Sierra Nevada, riparian habitat along streams also can function as suitable habitat for willow flycatcher. However, those areas must support the hydrologic and vegetation characteristics described for suitable meadows (e.g., standing or slow-moving water, and abundant and dense riparian vegetation).	2007, willow flycatcher was detected along the Upper Truckee River near the airport, approximately 1.4 miles downstream from the study area. The nearest known breeding population occurs along the Upper Truckee River, approximately 4.5 miles south (upstream) of the study area. (USFS unpublished data)
Peregrine falcon *Falco peregrinus*	FSS	SE, FP	SI	Nest and roost on protected ledges of high cliffs, usually adjacent to water bodies and wetlands that support abundant avian prey.	**Not expected to occur**. Suitable habitat not present in the study area.
Bald eagle *Haliaeetus leucocephalus*		SE, FP	SI	Use ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests are within 1 mile of water, in large trees with open branches. Roost communally in winter.	**Moderate potential to occur.** Potential foraging habitat is available in the study area. Large trees may function as perch sites. This species does not nest in the study area. Nearest known nest site is several miles away at Emerald Bay.
Osprey *Pandion haliaetus*		SC	SI	Associated with large fish-bearing waters. Nest usually within 0.25 mile of fish-producing water, but may nest up to 1.5 miles from water. In the Tahoe Basin, osprey nests are distributed primarily along the Lake Tahoe shoreline, at the northern portion of the east shore and southern portion of the west shore. Other osprey nest sites in the Tahoe Basin occur along the shorelines of smaller lakes (e.g., Fallen Leaf Lake) and in forest uplands up to 1.5 miles from lakes.	**Observed in the Study Area**. Ospreys have been observed in the study area along the Upper Truckee River (Fields, pers. comm., 2006); they also have been observed foraging in the large pond on the golf course, which is stocked with rainbow trout. They are not known to nest in the study area. Nest platforms were installed around the golf course in 2002, but have not been used by osprey (Fields, pers. comm., 2007a).

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Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
Great gray owl *Strix nebulosa*	FSS	SE		Found in Central Sierra mature mixed conifer forests near meadows. Scattered along the west slope of the Sierra, between 4,500 and 7,500 feet elevation, from Plumas County to Yosemite National Park.	**Not expected to occur.** Suitable habitat is not available in the study area. Habitat with biophysical attributes considered suitable for great gray owl (e.g., meadows bordered by large trees) occurs near the study area. However, these areas experience high disturbance levels, and neither the historic nor present occurrence of great gray owl in the Tahoe Basin has been confirmed.
California spotted owl *Strix occidentalis occidentalis*	FSS	SC		Occur in several forest vegetation types including mixed conifer, ponderosa pine, red fir, and montane hardwood. Nesting habitat is generally characterized by dense canopy closure (i.e., greater than 70 percent) with medium to large trees and multistoried stands (i.e., at least two canopy layers). Foraging habitat can include intermediate to late-successional forest with greater than 40 percent canopy cover.	**Low potential to occur.** Suitable breeding habitat is not available in the study area, and high disturbance levels in the surrounding area (e.g., residential and commercial development) contribute to a low potential for occurrence. In addition to general owl inventories conducted in 2006–2007, protocol surveys for California spotted owl were initiated by State Parks in 2007, and were continued in 2008 (Fields, pers. comm., 2008). No spotted owls have been detected.
Waterfowl species (collectively)			SI	Nest and roost in wetlands and around waters such as lakes, creeks, drainages, marshes, and wet meadows.	**Observed in the Study Area.** Several common waterfowl species occur in the study area including common merganser (*Mergus merganser*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), and Canada goose (*Branta canadensis*). Waterfowl occur in both the Upper Truckee River and the golf course ponds.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*		SC		Typically breeds in marshes that have tall emergent vegetation such as cattails or tules, in open areas near and over relatively deep water.	**Observed in the Study Area.** Species has been observed at artificial ponds in the golf course. The breeding status of this species in the study area is unknown. Due to the limited emergent vegetation and suitable

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Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
					marsh habitat, the study area is not expected to function as an important nesting area. However, nesting could occur in relatively low densities.
Mammals					
Pallid bat *Antrozous pallidus*	FSS	SC		Locally common at lower elevations in California and occurs in grassland, shrubland, woodland, and mixed conifer forests. Absent from highest elevation locations in the Sierra Nevada. Rocky outcrops, caves, crevices, and occasional tree cavities or buildings provide roosts.	**Low potential to occur.** High-quality roosting habitat is not present in the study area.
Sierra Nevada mountain beaver *Aplodontia rufa californica*		SC		Use riparian habitats with soft, deep soils for burrowing, lush growth of preferred food sources such as willow and alder, and a variety of herbaceous species for bedding material. Vegetation types preferred include wet meadows and willow-alder–dominated riparian corridors typically near water sources. Suitable riparian habitats are characterized by dense growth of small deciduous trees and shrubs near permanent water. Mountain beaver is generally solitary, except during its short breeding season; beavers spend a high proportion of their time in extensive underground burrow systems with multiple openings, tunnels, and food caches.	**Not expected to occur.** No suitable riparian habitat present in the study area. Surveys were conducted in 2008 by Wildlife Resource Consultants (Wildlife Resource Consultants 2008).

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*	FSS	SC		Range throughout California, mostly in mesic habitats. Limited by available roost sites (i.e., caves, tunnels, mines, and buildings).	**Not expected to occur.** Suitable habitat not present in the study area. Until 2007, no occurrences reported within the Tahoe Basin (Schlesinger and Romsos 2000). However, this species was detected several miles from the study area in Blackwood Canyon and Cookhouse Meadow in 2007 (Roth, pers. comm., 2008).
California wolverine *Gulo gulo luteus*	FSS	ST, FP		Inhabit upper montane and alpine habitats of Sierra Nevada, Cascades, Klamath, and north Coast Ranges. Need water source and denning sites. Rarely seen. Sensitive to human disturbance.	**Not expected to occur.** Suitable habitat not present in the study area. Very few documented occurrences in or near the Tahoe Basin.
Western red bat *Lasiurus blossevillii*	FSS	SC		Day roosting common in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. An association with intact riparian habitat may exist (particularly willows, cottonwoods, and sycamores).	**Moderate potential to occur.** Suitable roosting and foraging habitat exists in the study area along the riparian corridors, and the species has been detected at Tallac Marsh, approximately 5 miles outside the study area (Borgmann and Morrison 2004).
Sierra Nevada snowshoe hare *Lepus americanus tahoensis.*		SC		In the Sierra Nevada, found only in boreal zones, typically inhabiting riparian communities with thickets of deciduous trees and shrubs such as willows and alders.	**Observed in the Study Area.** Suitable habitat is present in the study area, and the species has been documented in the region, including the south Upper Truckee River watershed (USFS unpublished data). In December 2008, snowshoe hare tracks were observed in the west portion of the study area by a State Parks biologist.
Western white-tailed jackrabbit *Lepus townsendii*		SC		Year-round resident in sagebrush, subalpine conifer, juniper, and other habitats along the crest and the eastern slope of the Sierra Nevada. Uncommon to rare.	**Not expected to occur.** No suitable habitat present in the study area.

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Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
American marten *Martes americana*	FSS			Inhabit dense canopy conifer forests with large snags and downed logs. Prefers old growth stands with multiple age classes in vicinity.	**Moderate potential to occur.** Marten occurs throughout the Tahoe Basin in suitable habitat. In 2002, marten surveys were conducted in the study area by State Parks; no martens were detected (Fields, pers. comm., 2005a). The study area supports some suitable marten habitat (River Run Consulting 2006); however, the potential to function as denning/breeding habitat is limited by high levels of recreation and residential disturbance nearby.
Pacific fisher *Martes pennanti pacifica*	FC, FSS	SC		Inhabit stands of pine, Douglas fir, and true fir in northwestern California and Cascade-Sierra ranges. Fishers are considered extirpated throughout much of the Central and Northern Sierra Nevada (Zielinski, Kucera, and Ba 1995).	**Not expected to occur**. No suitable habitat present in the study area. This species is considered extirpated from the Tahoe Basin.
Mule deer *Odocoileus hemionus*			SI	Year-long resident or elevational migrant that prefer a wide distribution of various-aged vegetation for cover, meadow, and forest openings, and free water. In the Sierra Nevada, early to mid-successional forests, woodlands, and riparian and brush habitats are preferred because of the greater diversity of shrubby vegetation and woody cover. In addition to forage, vegetative cover is critical for thermoregulation. Suitable habitats include a mosaic of vegetation such as forest or meadow openings, dense woody thickets and brush, edge habitat, and riparian areas. Fawning habitat, used by does during birth and by newborn fawns, is of critical importance for reproductive success. A diversity of thermal cover, hiding cover, succulent forage, and water are needed during fawning. Optimal deer fawning habitat has been described as having	**Moderate potential to occur**. Suitable foraging and movement habitat is present in the study area and on nearby USFS lands; mule deer have been documented foraging and resting in riparian habitat upstream of the study area, above the U.S. 50 crossing in Meyers (River Run Consulting 2006). Mule deer have not been documented in the study area, including during 2008 mammal surveys conducted by Wildlife Resource Consultants. Deer fawning is not expected to occur in the study area. Riparian and meadow habitat in the study area may not be suitable for fawning because of disturbance levels and adjacent land uses.

Table 3.5-5
Special-Status Fish and Wildlife Species Evaluated for the Upper Truckee River Restoration and Golf Course Relocation Project

Common Name and Scientific Name	Regulatory Status[1]			Habitat Associations[1]	Potential for Occurrence[2]
	Federal	State	TRPA		
				moderate to dense shrub cover near forest cover and water, such as riparian zones. A source of surface water (e.g., creek or river) is especially important to mule deer. Typical fawning habitat varies in size, but an area of 5–26 acres is adequate, with optimal fawn-rearing habitat of around 400 acres.	
Sierra Nevada red fox *Vulpes vulpes necator*	FSS	ST		Inhabits upper montane and alpine habitats of Sierra Nevada, Cascades, Klamath, and north Coast Ranges. Need water source and denning sites. Rarely seen. Sensitive to human disturbance.	**Not expected to occur.** Presumed extirpated from the Tahoe Basin (Schlesinger and Romsos 2000).

Notes:
PAC = protected activity center; U.S. 50 = U.S. Highway 50; USFS = U.S. Forest Service
[1] Regulatory Status Definitions:
Federal—U.S. Fish and Wildlife Service:
FE = Endangered species under the Federal Endangered Species Act
FT = Threatened species under the Federal Endangered Species Act
FC = Candidate for listing under the Federal Endangered Species Act
FSS = USDA Region 5 Sensitive Species (FSM 2672)
State—California Department of Fish and Game:
ST = Threatened
SE = Endangered
FP = Fully Protected
SC = Species of special concern
TRPA:
SI = Special interest/threshold species

[2] Potential for Occurrence Definitions:
Observed—Species was observed in the study area during site visits or was documented there by another reputable source.
High potential to occur—All of the species' specific life history requirements can be met by habitat present in the study area, and populations are known to occur in the immediate vicinity.
Moderate potential to occur—Some or all of the species life history requirements are provided by habitat in the study area; populations may not be known to occur in the immediate vicinity, but are known to occur in the region.
Low potential to occur—Species not likely to occur because of marginal habitat quality or distance from known occurrences.
Not expected to occur—None of the species' life history requirements are provided by habitat in the study area and/or the study area is outside of the known distribution for the species. Any occurrence would be very unlikely.

Source: Data compiled by EDAW (now AECOM) in 2009

Willow flycatchers are migratory songbirds that nest in shrubby, wet habitats. In the Sierra Nevada, willow flycatchers tend to prefer willow stands interspersed with open meadow that are near standing or running water (Sedgwick 2000). Important characteristics of meadows suitable for breeding willow flycatchers are a high water table that results in standing or slow-moving water or saturated soils (e.g., “swampy” conditions); abundant riparian deciduous shrub cover (particularly willow [*Salix* spp.]), and riparian shrub structure with moderate to high foliar density that is uniform from the ground to the shrub canopy (Sanders and Flett 1989; Bombay 1999; Green, Bombay, and Morrison 2003).

One study in the Sierra Nevada documented that willow flycatcher nests typically are located in willows with about 70 percent foliage cover. Nests are also typically found about 3–4 feet above the ground and within about 7 feet from the edge of the clump (Sanders and Flett 1989).

Although less common in the Sierra Nevada, riparian habitat along streams can also function suitably for breeding willow flycatchers. However, such areas must support the hydrologic and vegetation characteristics described for suitable meadows (e.g., standing or slow-moving water, abundant and dense riparian vegetation). Stream channels that are high gradient, deeply incised, and lacking a floodplain (e.g., potential for saturated soils or standing water), and characterized by a sparse or narrow riparian vegetation corridor are not suitable for breeding willow flycatchers.

Although willow flycatchers have nested in meadows less than 1 acre in size, most nest in much larger meadows. Serena (1982) and Harris, Sanders, and Flett (1987) reported that more than 80 percent of such occurrences were in meadows larger than about 20 acres. An area of approximately 2.5 acres was estimated as the minimum size required to support a family of willow flycatchers in the Sierra Nevada (Sanders and Flett 1989). However, another study of 125 meadows in the Sierra Nevada showed that willow flycatchers were found only in meadows approximately 10 acres or larger (Harris, Sanders, and Flett 1987), although meadows as small as 0.6 acre have been reported to support successful breeding of flycatchers in the past (KRCD 1985). A recent summary of willow flycatcher occurrence data for the Sierra Nevada indicates that occupied meadows range in size from 1 to 716 acres, and average approximately 80 acres (USFS 2001).

Much of the study area may not provide suitable habitat for nesting willow flycatchers because of the degraded hydrologic conditions, channel morphology, and current willow structure and distribution (e.g., lack of saturated soils or standing water within willow stands during the breeding season; limited dense willow cover in floodplain). Potential habitat was mapped by River Run Consulting (2006). In 1998, a willow flycatcher was detected in the study area (Fields, pers. comm., 2005a); however, nesting has not been documented. Surveys conducted by State Parks in 2001, 2002, and 2007 did not detect willow flycatchers in the study area (Fields, pers. comm., 2005a, 2007). In 2007, willow flycatcher was detected along the Upper Truckee River near the airport, approximately 1.4 miles downstream of the study area (USFS unpublished data). The nearest known breeding population occurs along the southern reaches of the Upper Truckee River, approximately 4.5 miles south (upstream) of the study area (USFS unpublished data).

Osprey

Osprey is designated by CDFG as a species of special concern, and by TRPA as a special-interest species. Osprey is associated with large fish-bearing waters. In the Tahoe Basin, osprey nests are distributed primarily along the northern portion of the east shore and southern portion of the west shore of Lake Tahoe. Other osprey nests in the Tahoe Basin are located along the shorelines of smaller lakes (e.g., Fallen Leaf Lake) and in forest uplands up to 1.5 miles from water. Ospreys forage in Lake Tahoe as well as several other fish-bearing lakes, streams, and rivers within the Tahoe Basin.

Ospreys have been observed in the study area along the Upper Truckee River (Fields, pers. comm., 2006); they also have been observed foraging in the hole 9 pond on the golf course, which is stocked with rainbow trout. This species is not known to nest in the study area. Nest platforms were installed around the golf course in 2002; however, they have not been used by osprey (Fields, pers. comm., 2007).

Northern Goshawk

Northern goshawk is designated as a species of special concern by CDFG, is listed as sensitive by USFS Region 5, and is considered a special-interest species by TRPA. Northern goshawks generally require mature conifer forests with large trees, snags, downed logs, dense canopy cover, and open understories for nesting. Areas of foraging habitat for this species are forests with dense to moderately open overstories; open understories interspersed with meadows, brush patches, riparian areas; or other natural or artificial openings.

A small amount of suitable habitat is located in the study area (Fields, pers. comms., 2007b, 2008); however, northern goshawks have not been detected. Preliminary surveys for northern goshawks were initiated by State Parks in 2007, and full protocol surveys were initiated in 2008. No goshawks have been detected in the study area (Fields, pers. comm., 2008). Goshawks have been observed foraging in the northern portion of Washoe Meadows SP, near Angora Creek (River Run Consulting 2006) and are known to nest to the west.

Conifer forest in the study area is more likely to function as foraging habitat than nesting habitat because of forest structure and disturbance levels. The potential for this species to nest in the study area is low because of the lack of substantial area for suitable nesting and high disturbance levels in the surrounding area (e.g., noise from residential, recreation, and commercial development). Before the 2007 Angora fire, the nearest goshawk territory (and USFS protected activity center [PAC]) was located approximately 0.9 mile west of the study area, in the burn area. Presently, the nearest goshawk territories are approximately 0.6 mile (Seneca Pond), 1.4 miles (Lower Saxon Creek), and 1.8 miles (Tahoe Mountain) outside of the study area. The Seneca Pond PAC was recently established by USFS to replace the PAC lost in the 2007 Angora fire. Goshawks were detected in this new PAC in 2008.

Yellow Warbler

Yellow warbler is designated by CDFG as a species of special concern; TRPA is considering adding it as a special-interest species because of its potential to serve as an indicator of riparian health (TRPA 2007). In the Sierra Nevada, yellow warblers typically breed in wet areas with dense riparian vegetation. Breeding habitats primarily are willow patches in montane meadows, and riparian scrub and woodland dominated by willow, cottonwood, aspen, or alder with dense understory cover. Localized breeding has been documented in more xeric (dry) sites, including chaparral, wild rose (*Rosa* spp.) thickets, and young conifer stands (Siegel and DeSante 1999, RHJV 2004).

Willow scrub in the study area provides summer breeding and foraging habitat for yellow warblers. Individual yellow warblers were detected in 2005, 2006, and 2007 during avian surveys conducted by State Parks biologists (Fields, pers. comms., 2005b, 2007, 2008).Yellow warblers were detected in willow-dominated habitat along the Upper Truckee River in the study area. Although breeding has not been confirmed there (nest surveys have not been conducted), yellow warblers could nest in riparian habitats in the study area. As recently as 2004, Borgmann and Morrison (2004) documented yellow warblers breeding in the Upper Truckee Marsh, approximately 4 miles outside of the study area. However, a high level of nest parasitism (equal to or greater than 50 percent) by brown-headed cowbirds (*Molothrus ater*) also was documented at that location.

Yellow-Headed Blackbird

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) is designated by CDFG as a species of special concern. This species breeds primarily in marsh and wetland habitats with tall emergent vegetation such as cattails and tules. Relatively deep water and consistent water levels are important factors in nest placement and success, with water depth at breeding locations ranging from 16 centimeters (cm) to 110 cm (Shuford and Gardali, 2008).

Yellow-headed blackbirds have been observed in the study area during the breeding season, at the golf course pond west of the green at hole 4 (Fields, pers. comm., 2010); however, the breeding status of this species within the study area is unknown. The pond where yellow-headed blackbirds have been observed supports some potential breeding habitat. Because this species was observed during the breeding season and potential breeding habitat is present, yellow-headed blackbirds may nest there in low densities. The study area is not known to support other suitable breeding habitat for yellow-headed blackbird (Fields, pers. comm., 2010). The other golf course ponds do not provide high-quality marsh habitat; they have limited emergent vegetation that is confined to the margins of the ponds. Therefore, the study area likely does not function as a core breeding area for this species.

Olive-Sided Flycatcher

Olive-sided flycatcher is designated by CDFG as a species of special concern. In general, this species breeds in open canopy, late-succession forest. Open conifer forests are used within the Sierra Nevada, and forest edges are important for foraging. Tree species used for nesting varies throughout the species range; snags provide valuable habitat and nesting features throughout the range. Olive-sided flycatcher uses lofty perches for foraging and singing, and can often be found perched on the apical tip of trees, above the surrounding canopy (Shuford and Gardali, 2008).

Olive-sided flycatcher was documented in the study area in 2006 (Fields, pers. comm., 2006), and forest habitat conditions within the study area could support all life stages of this species. Mixed-conifer forests with ample edge habitat dominated by Jeffrey pine or lodgepole pine could provide foraging and nesting habitat for olive-sided flycatcher.

Long-Eared Owl

Long-eared owl (*Asio otus*) is designated by CDFG as a species of special concern. Specific habitat associations of long-eared owl vary over the species' range, and confusion has resulted over whether it is a forest or open-country species (Holt 1997). Long-eared owls nest in woodland, forest, and open settings (e.g., grassland, shrub-steppe, and desert). Wooded and nonwooded areas that are occupied by long-eared owls often support relatively dense vegetation (e.g., trees, shrubs) adjacent to or within larger open areas such as grassland or meadows (e.g., habitat edges) (Bloom 1994; Marks, Evans, and Holt 1994; Small 1994). However, this species also has been documented as breeding in contiguous conifer forest habitat with heavy mistletoe infestation (Bull, Wright, and Henjum 1989). In California, this species occurs in medium-aged and mature live oak and riparian woodlands. Long-eared owls also breed in oak thickets and conifer forests at higher elevations (Zeiner et al. 1990).

In 2006, a long-eared owl was detected in a conifer forest on the west side of the study area, by State Parks biologists during owl surveys (Fields, pers. comm., 2007). Also, a possible long-eared owl detection was made in 2007 (Fields, pers. comm., 2009). The breeding status of long-eared owl in the study area is unknown. Long-eared owls also have been documented elsewhere in the Tahoe Basin (Smith 2002); however, their habitat use has not been well studied.

Waterfowl

Waterfowl is designated by TRPA as a special-interest group of species because its nesting habitat in the Tahoe Basin is limited. Several waterfowl species occur in the Tahoe Basin during spring and summer months: Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), green-winged teal (*A. crecca*), common merganser (*Mergus merganser*), ruddy duck (*Oxyura jamaicensis*), northern pintail (*A. acuta*), northern shoveler (*A. clypeata*), cinnamon teal (*A. cyanoptera*), American widgeon (*A. americana*), gadwall (*A. strepera*), and ring-necked duck (*Aythya collaris*). Most of these species nest along shallow-water margins of streams or lakes, in areas of emergent vegetation or other vegetation that provides concealment. Typically nests are in marshes or adjacent meadows (Ehrlich, Dobkin, and Wheye 1988). Most of these ducks are dabblers and feed on vegetation in water approximately 6–10 inches deep. Ring-necked duck and common mergansers feed by diving under water, in aquatic areas that are anywhere from 3 feet to 10 feet deep.

Recreational activities and human access to wetlands may disrupt normal waterfowl behavior (Knight and Cole 1995). Because of increased recreational encroachment into wetland areas, habitat quality at TRPA-designated waterfowl threshold sites has been degraded and the threshold standard is not in compliance with the nondegradation standard (TRPA 2002).

In the Tahoe Basin, wetlands provide nesting, resting, and foraging habitat for waterfowl; open-water and some stream habitats provide foraging and resting habitat. Important areas for waterfowl are Pope Marsh, Upper Truckee Marsh, Taylor Creek Marsh, Grass Lake, and Spooner Lake (TRPA 2007). Several common waterfowl species—common merganser, mallard, Canada goose, American coot—occur in golf course ponds and the river corridor in the study area.

American Marten

American marten (*Martes americana*) is designated by the Regional Forester of USFS Region 5 as a sensitive species. In California, martens were historically distributed throughout the Sierra Nevada, Cascade Range, and the Coast Ranges, from the Oregon border south to Sonoma County. Presently, martens are distributed throughout the Sierra Nevada and Cascades (Buskirk and Zielinski 1997). This species occurs primarily between 5,500 and 10,000 feet elevation; in the Sierra Nevada, martens are found most frequently above 7,200 feet (USFS 2001). However, in the Tahoe Basin, martens have been detected regularly below 7,200 feet.

Suitable habitat for American marten consists generally of conifer forest with large-diameter trees and snags, large downed logs, moderate to high-canopy closure, and an interspersion of riparian areas and meadows. Martens are closely associated with relatively mesic, late-successional coniferous forests, although they may occur in other vegetation types. Important habitat attributes include vegetative diversity in predominantly mature forests, snags, and dispersal cover and large woody debris (Allen 1987). Studies in the Sierra Nevada indicate that martens have a strong preference for forest-meadow edges, and riparian forests appear to be important foraging habitats (Spencer, Barrett, and Zielinski 1983; Martin 1987). Marten natal dens are typically found in cavities in large trees, snags, stumps, logs, burrows, caves, rocks, or crevices in rocky areas. The dens are lined with vegetation and occur in structurally complex, late-successional forests (Buskirk and Ruggiero 1994). Canopy cover and the number of large, old trees in these patches exceed levels available in the surrounding area (USFS 2001).

The most important element for forest carnivore habitat may be the structural diversity of the vegetation (Allen 1987). Complex physical structures (large snags, large downed woody material, and debris piles), especially those near the ground, appear to provide protection from predators, prey sources, access to subnivean (below snow) spaces, and protective thermal microenvironments, especially during winter (Spencer, Barrett, and Zielinski 1983; Buskirk and Powell 1994; Thompson and Harestad 1994). Sites used for subnivean entry have greater percent cover and total volume of coarse woody debris, greater numbers of log layers, greater volume of undecayed and moderately decayed logs, less volume of very decayed logs, and fewer small root masses than surrounding forest stands (Corn and Raphael 1992). Other elements that contribute to habitat suitability include low branches of live trees, tree boles in various stages of decay, large coarse woody debris, presence of squirrel middens, a shrub layer to the canopy, and large-diameter trees and snags (USFS 2001).

American martens generally avoid habitats that lack overhead cover, presumably because these areas do not provide protection from avian predators (Allen 1987; Bissonette, Fredrickson, and Tucker 1988; Buskirk and Powell 1994; Spencer, Barrett, and Zielinski 1983). In Yosemite National Park, martens avoided areas lacking overhead cover and preferred areas with 100 percent overhead cover, especially when resting (Hargis and McCullough 1984). Preliminary results of studies in the southern Sierra Nevada indicate that marten rest sites are associated with closed canopy, multilayered conditions (Zielinski, Kucera, and Ba 1995). Martens selected stands with 40–60 percent canopy closure for resting and foraging, and they avoided stands with less than 30 percent canopy closure (Spencer, Barrett, and Zielinski 1983).

American marten occurs throughout the south Tahoe Basin in its preferred habitat. In 2002, marten surveys were conducted in the study area by State Parks biologists; no martens were detected (Fields, pers. comm., 2005a). The study area supports some suitable marten habitat (River Run Consulting 2006) in conifer forests and forest-meadow edges; however, its potential to function as denning/breeding habitat is limited by high levels of recreation, residential disturbance nearby, and marginal forest structure conditions for the species.

Sierra Nevada Snowshoe Hare

Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*) is designated by CDFG as a species of special concern. This species is associated with riparian communities with thickets of willows and alders, and conifer forests with abundant cover, composed of shrubs or small trees. In the Tahoe Basin, snowshoe hare can be found in dense brush near the edges of meadows or riparian communities.

Conifer forest, willow-riparian, and meadow habitats in the study area provide suitable habitat for snowshoe hare, and the species has been documented in the region, including the south Upper Truckee River watershed (USFS unpublished data). In December 2008, snowshoe hare tracks were observed in the west portion of the study area outside the study area by a State Parks biologist. Because of the high level of human activity in and around the study area the study area is not expected to provide important breeding habitat for this species.

Western Red Bat

Western red bat (*Lasiurus blossevilli)* has a broad distribution, ranging from British Columbia, Canada, to Chile. In California, western red bat is designated by CDFG as a species of special concern and by USFS Region 5 as sensitive. Suitable habitat includes edge habitats adjacent to streams or open fields, orchards, and sometimes urban areas. Roost sites are generally hidden from view in all directions; lack obstruction beneath, allowing the bat to drop downward for flight; lack lower perches that allow visibility by predators; have dark ground cover to minimize solar reflection; have nearby vegetation to reduce wind and dust; and are generally located on the south or southwest side of a tree. They may have an association with intact riparian habitat, particularly willow, cottonwoods, and sycamores.

Western red bat is not known to occur in the study area; however, bat surveys have not been conducted there. Suitable roosting and foraging habitat exists along riparian corridors in the study area. This species has been detected at Tallac Marsh, approximately 5 miles away (Borgmann and Morrison 2004). .

Mule Deer

Mule deer is designated by TRPA as a special-interest species. Both the Carson River and Loyalton-Truckee deer herds occur in the Tahoe Basin during snow-free months for fawning and summer range activities. Mule deer numbers in the Tahoe Basin are relatively low. Over the last 10 years, migratory habitat loss and fragmentation has increased throughout the herds' range because of residential development; also, the mule deer population has declined. The loss of wintering habitat and reduced access to wintering areas may be the primary causes of this population decline (TRPA 2007).

Mule deer use early to mid-successional stages of several vegetation types, including riparian, meadow, and forest for summer range. Important habitat requirements for mule deer fawning include undisturbed meadow and riparian areas that provide hiding cover and forage. Mule deer have been documented foraging and resting in riparian habitat upstream of the study area, above the U.S. Highway 50 (U.S. 50) crossing in Meyers (River Run Consulting 2006). Mule deer have not been documented in the study area, including during 2008 mammal surveys conducted by Wildlife Resource Consultants. Deer fawning is not expected to occur in the study area. Important habitat requirements for mule deer fawning include undisturbed meadow and riparian areas that provide hiding cover and forage. Riparian and meadow habitat in the study area is likely not suitable for fawning because of disturbance levels from recreation (including golfers, pedestrians, and bicyclists), and residential development (including the regular presence of dogs), and from adjacent land uses. Because the study area provides cover and forage habitat, and the species has been documented nearby, mule deer may occasionally use the study area for foraging and could be disturbed by construction activities. However, the study area is not considered an important or core foraging area for mule deer. Mule deer are relatively rare in the Tahoe Basin near the study area. Deer have not been detected in the study area incidentally during biological surveys (for other species) conducted over the last several years; and the presence of dogs and other disturbance sources reduces the habitat quality for mule deer.

Sensitive Habitats

Sensitive habitats are those of special concern to resource agencies or those that are afforded specific consideration, based on the TRPA Goals and Policies, TRPA Code of Ordinances, Section 404 of the CWA, and other applicable regulations. This concern may be due to locally or regionally declining status of these habitats, or because they provide important habitat to common and special-status species. Many of these communities are tracked in CDFG's Natural Diversity Database, an inventory of the locations and conditions of the State's rarest plant and animal taxa and vegetation types (CNDDB 2008).

Wetland habitats in the study area, including seasonal wetlands, intermittent drainages, and spring/fen complex, would be considered sensitive habitats as defined above. Most of the areas within these habitats are designated as SEZ. These areas would likely be considered jurisdictional by USACE and the Lahontan RWQCB under Section 404 of the Federal CWA and the State's Porter-Cologne Act. In addition, CDFG has jurisdiction over activities affecting the bed and bank of the drainages traversing the study area, including the Upper Truckee River and Angora Creek, and their adjacent riparian vegetation.

Other Ecologically Significant or Special-Interest Resources

A resource is considered ecologically significant or of special interest if it is:

- important to the essential character of the unit and contributes, in part, to its statewide significance;
- regionally significant, is an important component of a systemwide plan, or contributes to the persistence of regional or statewide biodiversity; or
- documented as significant on recognized preservation or protection lists, or is otherwise designated with special status by a recognized authority.

Four other resources in the study area are considered ecologically significant or of special interest: the riparian bird community and neotropical migrant landbirds, the raptor community, wildlife movement corridors, and common migratory birds.

Riparian Bird Communities and Neotropical Migrant Landbirds

The significance of riparian bird communities and neotropical migrant birds was introduced previously in the section "Wildlife Habitat Functions." The quality of riparian habitats and diversity of neotropical migrants in the southern portion of the Tahoe Basin indicate the importance of this area to regional avian conservation and management. Riparian, meadow, and forest habitats in the study area are favorable for numerous neotropical migrant bird species during the breeding season as well as during spring and fall migration.

Raptor Community

Raptors are considered ecologically significant as a group because they:

- function at a high trophic (feeding) level and their populations are typically sensitive to the distribution and local abundance of prey populations;

- represent a wide range of life histories with respect to nesting, foraging, and habitat-use requirements;
- include several species sensitive to habitat disturbance and loss; and
- are generally visible and an important component of a wildlife viewing experience.

The extent and mix of forest, riparian, and meadow habitats found in the study area provide winter, breeding, and migration habitat for many raptor species known to occur throughout the Tahoe Basin. Raptors known to occur in the study area are great horned owl, western screech-owl, northern saw-whet owl, Cooper's hawk, osprey, and long-eared owl (Fields, pers. comms., 2005b, 2007, 2009).

Wildlife Movement Corridors

Wildlife movement corridors are considered an important ecological resource by various agencies (e.g., USFWS, USFS, State Parks, and TRPA) and are also protected under the TRPA Code of Ordinances. Movement corridors may provide favorable locations for wildlife to travel or disperse between various habitat areas (e.g., foraging sites, breeding sites, cover areas, and preferred summer and winter range locations).

The California Essential Habitat Connectivity Project is a recently-completed, peer-reviewed statewide assessment of important habitat linkages (Spencer et al. 2010). The project's goal was to identify large remaining blocks of intact habitat or natural landscape at a coarse spatial scale, and model linkages between them that are important to maintain as corridors for wildlife. The study area is not within any area identified as a high priority for maintaining regional wildlife corridors. However, the study area could function as a movement corridor or a link to a larger movement route at multiple spatial scales. On a regional scale, because of its large size, geographic position, and habitat types and quality, the study area provides a stepping stone or seasonal habitat for waterfowl and shorebirds migrating along the Pacific Flyway. On a watershed (i.e., across habitats within the Upper Truckee watershed or Tahoe Basin) or site (i.e., within the study area) scale, wetland, riparian, and aquatic habitats may facilitate movement of waterbirds, songbirds, and other species. The primary feature of the study area that provides value for wildlife movement would be the riparian corridor of the Upper Truckee River. The riparian habitat is not continuous, because the golf course abuts the riverbank in several locations, so its current wildlife corridor value of the river is degraded.

The study area is not expected to function as a significant corridor for common or sensitive wildlife species due to its proximity to residential neighborhoods to the west (North Upper Truckee Road and adjoining neighborhoods), north (Echo View Estates, Tahoe Mountain), and south (San Bernardino Road and South Upper Truckee neighborhoods), and well-traveled roads (U.S. 50 to the south and east, Sawmill Road to the north). On a watershed scale, the roadway and residences may limit the study area's potential value to facilitate long-ranging wildlife movement, particularly that of medium-sized and large animals. However, Washoe Meadows SP composes a large block of open space, positioned between Angora Ridge and the south Upper Truckee River watershed. The mix of forest, meadow, and riparian habitat in this block of open space, within the context of the larger complex of open space or low-density development to the north and south of the study area, provides a habitat link within the Upper Truckee watershed and the Tahoe Basin.

Common Migratory Birds

A large number of common bird species are migratory and fall under the jurisdiction of the MBTA (see the discussion of Federal regulations in the "Regulatory Setting" section above). A comprehensive list of MBTA species that could occur in the study area is too lengthy to provide here (because it would contain essentially all native birds); however, it includes familiar species such as mountain chickadee, red-breasted nuthatch, yellow-rumped warbler, and several other warbler species. The nests of all migratory birds are protected under the MBTA, which makes it illegal to destroy any active migratory bird nest. Several migratory bird species nest in the study area, as described above.

3.5.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of Federal, State, and local agencies. Effects on thresholds of the Tahoe Regional Planning Compact were considered during development of mitigation measures for significant project impacts. The project's effects on thresholds are further described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Under CEQA, an alternative was determined to result in a significant impact related to biological resources if it would:

- have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- have a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG and USFWS;
- have a substantial adverse effect on Federally protected wetlands as defined by CWA Section 404 (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan; or
- result in the loss of forest land or conversion of forest land to non-forest use.

NEPA Criteria

Under NEPA, an alternative was determined to result in a significant impact related to vegetation and wildlife if it would:

- substantially reduce the size, continuity, or integrity of a plant community through temporary or permanent removal, interruption of natural processes that support it, and/or disturbance that favors the establishment of invasive nonnative species;
- substantially reduce the size, continuity, or integrity of wildlife or fish habitat, or result in unnatural changes in the abundance, diversity, or distribution of wildlife or fish species; or
- have a substantial effect, either directly or through habitat modifications, on any species indentified as a candidate, threatened, endangered, or special-status species under the ESA or the MBTA.

These factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative was determined to result in a significant impact related to vegetation, wildlife, and aquatic resources if it would:

- remove native vegetation in excess of the area utilized for the actual development permitted by TRPA's land capability program/Individual Parcel Evaluation System (IPES);
- remove riparian vegetation or other vegetation associated with critical wildlife habitat, through either direct removal or indirect lowering of the groundwater table;
- introduce new vegetation that would require excessive fertilizer or water, or would provide a barrier to the normal replenishment of existing species;
- cause a substantial change in the diversity or distribution of species, or the number of any species of plants (including trees, shrubs, grass, crops, microflora, and aquatic plants);
- reduce the numbers of any unique, rare, or endangered species of plants;
- remove streambank and/or backshore vegetation, including woody vegetation such as willows;
- remove any native live, dead, or dying trees 30 inches or greater DBH within TRPA's Conservation or Recreation land use classifications;
- change the natural functioning of an old-growth ecosystem;
- cause a substantial change in the diversity or distribution of species, or the numbers of any species of animals (birds or land animals including reptiles, insects, mammals, amphibians, or microfauna);
- reduce the number of any unique, rare, or endangered animal species;
- introduce new species of animals into an area, or result in a barrier to the migration or movement of animals; or
- cause the quantity or quality of existing wildlife habitat to deteriorate.

METHODS AND ASSUMPTIONS

Fisheries and Aquatic Resources

The impact analysis for fisheries and aquatic resources examines effects of each alternative in both the short term, temporary and the long term. Short-term, temporary effects could occur over hours, days, or weeks during the active construction phase. In addition, the river system is expected to experience adjustments after construction, so the analysis of short-term, temporary impacts also looks at interim effects that might occur during the first few years after construction, assuming that streamflows are at least average, or until the first moderately large flood event (approximate 10-year peak flow) occurs. Long-term effects are the result of changes to the river channel and associated riparian corridor and include changes to habitat conditions over a period of time after the channel has responded and achieved a new dynamic equilibrium.

Information related to the study area and vicinity and professional experience on similar projects has been referenced and incorporated into the analysis of the river system history, existing condition, likely future conditions, and conditions expected under each action alternative. The impact analysis for fisheries and aquatic resources relies on information and analysis provided in Section 3.3, "Geomorphology and Water Quality," and Section 3.4, "Hydrology and Flooding." As discussed in Section 3.4, "Geomorphology and Water Quality" potential violations of the narrative turbidity standard at the low end of the NTU range, while considered a significant impact for CEQA/NEPA/TRPA analysis for the water quality discussion in this document, would not necessarily correspond to an adverse effect on beneficial uses related to fisheries and other aquatic organisms. To evaluate effects on beneficial uses the water quality analysis considers aesthetic values under Non-Contact Recreation Use designation in the Basin Plan (Lahontan RWQCB 1995:2-2) as the most sensitive indicator of an effect on any beneficial uses. The numeric turbidity values that would correlate with this impairment of aesthetics-related beneficial use might not occur unless turbidity was increased beyond natural seasonal background by several orders of magnitude. This is well beyond the <10 percent increase in background turbidity standard of the Basin Plan that was used to evaluate water quality impacts in the water quality section due to the sensitivity of Lake Tahoe. Turbidity levels would also likely need to exceed the minimum aesthetic criterion to have adverse effects on other beneficial uses, including those supporting aquatic organisms. A finding of a significant unavoidable water quality impact caused by exceedance of the stringent numeric standard does not automatically correspond to an adverse condition for aquatic organisms because impairment of related beneficial uses would likely require the proposed project to elevate turbidity levels considerably further than 10 percent above background for a larger magnitude and longer duration beyond the limited area and brief period that was used for the water quality analysis. Significance of a potential impact to aquatic species was evaluated based on anticipated effects on population levels, survival rates, distribution, and habitat use.

Vegetation and Wildlife

Potential impacts of each alternative on vegetation and wildlife resources were initially identified by overlaying geographic information system (GIS) layers of proposed project components on the vegetation map of the study area shown as Exhibit 3.5-1. Any area of proposed modification that overlapped with natural communities was considered to be directly affected during project construction. Short-term construction impacts would occur where natural vegetation would be removed to modify the geomorphology of the site or construct new facilities. Long-term impacts would occur in areas that would experience a conversion in land use and cover (i.e., conversion of natural vegetation to golf course, existing stream channel to restored stream channel). Impacts on trees were determined by estimating the number of trees to be removed based on the project footprint and the density of trees per acre as determined by a State Parks forester (Shasha, pers. comm., 2009).

The boundaries of SEZs within the study area were derived from the revised TRPA land capability map and were used to calculate the SEZ acreage that would be lost or gained under each alternative. A formal wetland delineation according to USACE criteria will be conducted after selection of a preferred alternative and prior to project permitting, but it is not needed for the EIR/EIS/EIS phase. The detailed map of plant community boundaries (Exhibit 3.5-1) and the map of SEZ boundaries were used as an intermediary method of determining the approximate limits of potentially jurisdictional wetlands. This method was approved during informal consultation with the Sacramento District office of USACE during discussion regarding a nearby and related project, the Upper Truckee River and Marsh Restoration Project (Roukey, pers. comm., 2008). Areas mapped as the following vegetation types are presumed to potentially qualify as jurisdictional wetlands: lodgepole pine–mesic type forest (LPM), obligate sedge wetland (OM), spring and fen complex (OM/MF/LP), wet meadow (WM), willow/wet meadow (W/WM), willow scrub (W), mesic meadow (MM), mesic meadow/wet meadow (MM/WM), willow/mesic meadow (W/MM), mesic forb (MF), and possibly dry meadow (DM).

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Fisheries and Wildlife Resources—Section 3.5.1, "Affected Environment," discusses all special-status fish and wildlife species evaluated in this analysis, and Table 3.5-5 summarizes the potential for each of these species to occur in the study area. Those wildlife and fish species not expected or with a low probability to occur (because of a lack of suitable habitat, recent focused surveys that did not detect the species, or lack of other occurrence records) are not addressed further in this analysis. Implementation of this project is not expected to affect those species.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.5-1 (Alt. 1) Short-Term Degradation of Fish and Aquatic Habitat Resulting from Construction and Initial Channel Response. *Under Alternative 1, no short-term effects or changes to fish and aquatic habitat would result from construction or initial channel response because no construction would occur. The fish community and aquatic habitat conditions would continue to be affected by ongoing altered geomorphic processes and periodic bank treatments. This impact would be **less than significant**.*

The size and configuration of stream channels or associated aquatic habitats in the study area would not be physically modified under Alternative 1. However, aquatic habitat functions and values for fish and other aquatic organisms would continue to be influenced by trends in natural geomorphic processes caused by the current encroachments on the stream corridor. Channelization, incision, and resulting channel widening (in response to incision) of the Upper Truckee River channel would continue to occur throughout the project reach.

It is anticipated that treatments would be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced if needed. However, the potential for application of these treatments would be the same as under current conditions. The nature and extent of these potential activities are unknown and would not be a direct result of implementing Alternative 1. In the short term the simplified condition of aquatic habitats would remain similar to the existing degraded condition. This impact would be less than significant.

No mitigation is required.

IMPACT 3.5-2 (Alt. 1) Long-Term Changes to Fish and Aquatic Habitat. *Under Alternative 1, fish and aquatic habitat in the study area would not change in the long term because no changes would be made to the river system. The fish community and aquatic habitat conditions would continue to be affected by ongoing altered hydraulic and geomorphic processes and periodic treatments to address bank erosion. This impact would be **less than significant**.*

Stream channels in the study area would not be physically modified under Alternative 1, and aquatic habitat conditions would continue to be influenced by natural geomorphic trends caused by past land uses and current encroachments on the stream corridor. Treatments may be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced if needed. In the long term (over many years), portions of the widened Upper Truckee River channel with simplified, degraded habitat conditions would likely adjust to disturbances by developing inset floodplains in areas of the project reach where the golf course is not adjacent to the river and where treatments would not be applied periodically. With such adjustments, the low-flow channel could become more defined, resulting in very minor, localized beneficial changes to aquatic habitats relative to existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.5-3 (Alt. 1) **Short-Term, Construction-Related Disturbance or Loss of Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ).** *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented and would not affect sensitive habitats. Eroding banks along the Upper Truckee River would continue to be periodically treated and maintained as necessary; some of these treatments could be implemented within or adjacent to sensitive habitats. However, the potential for and frequency of implementing these treatments would be the same as under current conditions. Any potential effects of ongoing maintenance of riverbanks on sensitive habitats would be* ***less than significant****.*

Sensitive habitats in the study area include riparian vegetation along the Upper Truckee River, Angora Creek, and the unnamed creek; jurisdictional wetlands; SEZ; and spring complexes (including fens) west of the river. Under Alternative 1, no construction for river restoration or golf course reconfiguration would be implemented. It is anticipated that treatments may be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e. g., bridges), or bridges may be replaced, as needed. Repairs to existing bank stabilization, infrastructure, and additional spot stabilization would continue to occur in response to erosion, damage, or failure, as it does presently. These periodic treatments would also serve to retain vegetation within the riparian corridor and floodplain. Some of these treatments could be implemented within or adjacent to sensitive habitats along the Upper Truckee River. However, the potential for and general frequency of implementing these treatments would be the same as under current conditions; and the specific nature and extent of these potential activities are unknown and would not be a direct result of implementing Alternative 1. Therefore, any potential effects of ongoing treatment and maintenance of riverbanks on sensitive habitats under Alternative 1 would be less than significant. Riparian areas subject to continued treatment and maintenance activities under Alternative 1 are not in the vicinity of the spring complexes (including fens) west of the Upper Truckee River; these areas would not be affected.

No mitigation is required.

IMPACT 3.5-4 (Alt. 1) **Short-Term, Construction-Related Disturbance or Removal of Special-Status Plants.** *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented and habitat conditions for special-status plants would remain the same as under existing conditions. Eroding banks along the Upper Truckee River would continue to be periodically treated and maintained as necessary. Although special-status plants have not been documented in riparian zones where bank treatments would be implemented, some of these treatments could be implemented within or adjacent to habitat for these species. If special-status plants occur in suitable habitats along riverbanks in the study area, ongoing bank erosion or periodic treatments could disturb or remove them. However, the potential for and frequency of implementing these treatments would be the same as under current conditions. Any potential effects of ongoing maintenance of riverbanks on special-status plants would be* ***less than significant****.*

Riparian zones in the study area (along the Upper Truckee River, Angora Creek, and the unnamed creek) provide suitable habitat for special-status plant species, including marsh skullcap, Oregon fireweed, and Bolander’s candle moss. Under Alternative 1, no construction for river restoration or golf course reconfiguration would be implemented. It is anticipated that treatments may be applied to eroding riverbanks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e. g., bridges), or bridges may be replaced, as needed. Repairs to existing bank stabilization, infrastructure, and additional spot stabilization would continue to occur in response to erosion, damage, or failure, as it does presently. These periodic treatments would also serve to retain vegetation within the riparian corridor and floodplain. Special-status plant species have not been documented in riparian zones where treatments would occur; however, some of these treatments could be implemented within or adjacent to suitable habitat for these species. If special-status plant species occur in suitable habitats along riverbanks in the study area, ongoing bank erosion or periodic bank treatments could disturb or remove them. The potential for and general frequency of implementing these treatments would be the same as under current conditions; and the specific nature and extent of these potential activities are unknown and would not be a direct result of implementing Alternative 1. Therefore, any potential effects of ongoing treatment and maintenance of riverbanks on special-status plant species under Alternative 1 would be less than significant.

No mitigation is required.

IMPACT 3.5-5 (Alt. 1)	**Long-Term Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens and SEZ) and Special-Status Plant Species.** *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented, and sensitive habitats and habitat for special-status plants would remain the same as under existing conditions. Streambanks within the study area are expected to continually erode, resulting in long-term degradation of riparian vegetation. Also, the 18-hole golf course would remain as it currently exists, much of which is adjacent to the Upper Truckee River. Although the adverse condition of riparian habitat degradation would continue, it would not be a change caused by the alternative; therefore, this impact would be* ***less than significant.***

Under Alternative 1, project-generated changes would not occur and the banks of the Upper Truckee River would continue to respond to past land uses through channel widening. Treatments may be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced, as needed. Repairs to existing bank stabilization, infrastructure, and additional spot stabilization would occur in response to erosion, damage, or failure, as it does presently. These periodic treatments would also serve to retain vegetation within the riparian corridor and floodplain; however, erosion of the unstable streambanks would continue degrading sensitive habitats within the riparian corridor and floodplain, including adjacent woody riparian vegetation along the riverbanks. This is an existing adverse condition that would continue unchanged under the alternative. Under Alternative 1, golf course use would continue adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek and would occupy 123 acres of SEZ, limiting available riparian function and habitat. Effects on sensitive habitats would be similar to existing and ongoing conditions.

Ongoing operational uses of the study area are not expected to result in substantial adverse impacts to special-status plant species because areas presently used for golf course activities are not considered suitable habitat for these species. Riparian zones in the study area (along the Upper Truckee River, Angora Creek, and the unnamed creek) provide suitable habitat for special-status plants, including marsh skullcap, Oregon fireweed, and Bolander’s candle moss. As previously discussed, the quality of riparian habitat in the study area for these species could gradually become degraded in the long term with the continuation of streambank erosion; also, emergency or as-needed repair of riverbanks could result in some disturbance or loss of riparian vegetation. Disturbances associated with golf course use and operations (e.g., trampling of vegetation) would continue to limit riparian habitat functions along the Upper Truckee River, Angora Creek, and the unnamed creek.

The four spring complexes would not be affected by Alternative 1, including the previously disturbed wetland within the old quarry.

Although the adverse condition of riparian and special-status plant habitat degradation would continue, it would not be a change caused by Alternative 1. These effects are expected to be similar to existing and ongoing conditions. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.5-6 (Alt. 1) **Tree Removal and Forest Land Conversion.** *No trees would be removed under Alternative 1 beyond existing nonproject-related fuels and forest management. State Parks would continue to manage vegetation and periodically remove trees for fuels reduction, forest health, and riparian/hardwood management. Any effects related to these activities would be similar to those under existing and ongoing conditions. Impacts related to ongoing tree removal to achieve existing vegetation and fuels management objectives would be the same as current conditions, so it would be considered* ***less than significant.***

Under Alternative 1, existing conditions in the study area would remain unaltered from current conditions. The Upper Truckee River would not be restored and the golf course would not be reconfigured; therefore, no trees would be removed beyond existing nonproject-related fuels and forest management purposes, and no conversion of forest land to non-forest use would occur. State Parks would continue to periodically manage vegetation for fuels reduction, forest health, and riparian/hardwood management. Although State Parks has treated much of the study area for fuels reduction as part of the Lake Sector Wildfire Management Plan, additional tree removal and stand thinning may occur in the future to further reduce tree densities and fuels in some areas (Walck, pers. comm., 2010). Additionally, some lodgepole pines would be removed within the riparian corridor as part of State Parks' existing management objectives to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project). Any effects related to these activities would be similar to those under existing and ongoing conditions and would not affect any old growth forests. Therefore, impacts related to ongoing tree removal to achieve existing vegetation and fuels management objectives would be less than significant.

No mitigation is required.

IMPACT 3.5-7 (Alt. 1) **Introduction and Spread of Weeds and Aquatic Invasive Species.** *Under Alternative 1, no project-related ground-disturbing activities would occur to facilitate weed or aquatic species invasion into the study area. Spot herbicide treatments of weeds in the existing golf course footprint would continue. This impact would be* ***less than significant.***

Under Alternative 1, the Upper Truckee River would not be restored and the golf course would not be reconfigured; current conditions as they relate to the introduction and spread of weeds and aquatic invasive species would persist but would not be a direct result of Alternative 1 implementation. Bank stabilization treatments may be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced as needed. However, the nature and extent of these modifications are unforeseeable. As described in Chapter 2, "Project Alternatives," spot herbicide treatments of weeds in the existing golf course footprint would continue. This impact would be less than significant.

No mitigation is required.

IMPACT 3.5-8 (Alt. 1) **Short-Term, Construction-Related Disturbance or Loss of Special-Status Wildlife Species and Habitats.** *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented and would not affect special-status wildlife species or habitats. Eroding banks along the Upper Truckee River would continue to be periodically treated and maintained as necessary; some of these treatments could be implemented within or adjacent to habitat for special-status wildlife species. However, the potential for and frequency of implementing these treatments would be the same as under current conditions. Any potential effects of ongoing maintenance of riverbanks on special-status wildlife species or their habitats would be* ***less than significant.***

Six special-status wildlife taxa have been documented in the study area, and eight additional special-status wildlife species were identified as having a moderate or high potential to occur within the study area (Table 3.5-5). Under Alternative 1, no construction for river restoration or golf course reconfiguration would be implemented. It is anticipated that treatments may be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e. g., bridges), or bridges may be replaced, as needed. Repairs to existing bank stabilization, infrastructure, and additional spot stabilization would continue to occur in response to erosion, damage, or failure, as it does presently. These periodic treatments would also serve to retain vegetation within the riparian corridor and floodplain. Some of these treatments could be implemented within or adjacent to habitat for special-status wildlife species along the Upper Truckee River (e.g., yellow warbler). If special-status wildlife species are present where periodic bank treatments would be implemented, the treatment and maintenance activities could disturb them, particularly during the breeding season. However, the potential for and general frequency of implementing these treatments would be the same as under current conditions; and the specific nature and extent of these potential activities are unknown and would not be a direct result of implementing Alternative 1. Therefore, any potential effects of ongoing treatment and maintenance activities on special-status wildlife species or their habitats under Alternative 1 would be less than significant.

No mitigation is required.

IMPACT 3.5-9 (Alt. 1)

Long-Term Effects on Special-Status and Common Wildlife Species and Habitats. *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented, and habitat for special-status and common wildlife species would remain the same as under existing and ongoing conditions. Streambanks within the study area are expected to continually erode, resulting in long-term degradation of riparian habitat that provides habitat for some special-status and common wildlife species. Also, the 18-hole golf course would remain as it currently exists, much of which is adjacent to the Upper Truckee River. Although the adverse condition of riparian habitat degradation would continue, it would not be a change caused by Alternative 1; therefore, this impact would be **less than significant**.*

Riparian zones in the study area (along the Upper Truckee River, Angora Creek, and the unnamed creek) provide suitable habitat for special-status wildlife species, including yellow warbler and waterfowl, and a variety of common species. Upland habitats (e.g., conifer forest) also provide habitat for special-status and common wildlife species. Under Alternative 1, ongoing operational uses of the study area are not expected to result in substantial adverse impacts to special-status or common wildlife species. The quality of riparian habitat in the study area could gradually become degraded in the long term with the continuation of streambank erosion; also, emergency or as-needed repair of riverbanks could result in some disturbance or loss of riparian vegetation. Disturbances associated with golf course use and operations (e.g., noise generated by visitors, staff, and equipment, and trampling of vegetation) would continue to limit riparian habitat functions along the Upper Truckee River, Angora Creek, and the unnamed creek. The quality of riparian habitat would continue to be relatively low for special-status wildlife species sensitive to vegetation composition and structure (e.g., density), patch size, and hydrology of riparian zones, such as willow flycatcher and yellow warbler. These effects are expected to be similar to existing and ongoing conditions. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.5-10 (Alt. 1)

Effects on Potential Wildlife Movement Corridors. *Under Alternative 1, the river restoration and golf course reconfiguration would not be implemented, and potential wildlife movement corridors would remain the same as under existing and ongoing conditions. Habitat quality could gradually become degraded in the long term along the Upper Truckee River corridor with the continuation of streambank erosion. However, this impact would be **less than significant**.*

While no wildlife movement corridors have been confirmed to occupy the study area, its large size and location between the river and nearby forest areas make it potentially suitable for wildlife movement. Under Alternative 1, no construction for river restoration or golf course reconfiguration would be implemented. Therefore, no impact to potential wildlife corridors as a result of project construction would occur. As discussed in existing conditions above, the quality of riparian habitat along the Upper Truckee River, which could function as a movement corridor, is degraded by the presence of the golf course close to or abutting the river in several locations. Riparian habitat quality could become more degraded in the long term with the continuation of streambank erosion in locations where the golf course already limits the width of riparian vegetation. However, the potential for the SEZ and other portions of the study area to function as a wildlife movement corridor would be similar to existing conditions. Therefore, this potential impact would be less than significant.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.5-1 (Alt. 2)

Short-Term Degradation of Fish and Aquatic Habitat Resulting from Construction and Initial Channel Response. *Alternative 2 construction activities could result in temporary adverse effects on water quality, aquatic habitats, and the aquatic community. Effects could also occur during the initial channel-response period within the study area and in areas downstream. This impact would be* ***significant****.*

Alternative 2 involves restoring a 13,430-foot-long reach of the Upper Truckee River and adjoining floodplain; relocating several golf course holes to an area on the west side of the river that contains less-sensitive land that is farther from the river; and replacing all five existing bridges with one new, longer bridge.

Water Quality: Sedimentation and Turbidity, Release and Exposure of Contaminants

Construction activities would disturb instream sediments and soils adjacent to waterways for 3–4 years. As discussed in Chapter 2, “Project Alternatives,” and Section 3.4, “Geomorphology and Water Quality,” the project would include specific measures to protect water quality:

- Wash cobbles and gravels before installation.
- Use a combination of sod blankets, willow transplants or wattles, woody debris or mulch or erosion control fabrics over seeds to stabilize excavated inset-floodplain surfaces.
- Prime new and reconnected meanders by prewetting and introducing controlled flows that would remain isolated from the active channel (protected by berms, water-filled dams, or similar measures), then pump turbid water into settling basins or spray the water onto uplands without return flow to the channel.

The project would also be expected to include a full suite of construction best management practices (BMPs); however, exact BMP measures are not known at this time.

During the first year of construction, diversion of the streamflow around the bridge piers and pumped dewatering of the interior of isolated work areas would be anticipated. The year 2, pre-wetting of reconnected historic meanders, constructed new river channel, and irrigation of associated re-vegetation may require partial diversion and/or pumping of streamflow, but no in-channel work is planned that would require full diversion/bypassing of streamflow. Year 3 of construction would require temporary dewatering of the entire streamflow around sites or reaches that would receive streambed and streambank treatments. In areas of active streamflow, dewatering would be required at the footings and abutments of existing bridges that would be removed. Reaches would be constructed sequentially along the river (either upstream to downstream or downstream to upstream).

Even with the proposed measures described above, the erosion or disturbance of instream sediments and soils resulting from construction could still temporarily increase turbidity and cause sedimentation downstream of the construction sites on an intermittent basis in the study area if soils were transported in the river flows or stormwater runoff. Reduced fish population levels and survival rates have been linked to elevated turbidity levels and silt deposition. Prolonged exposure to high levels of suspended sediment would reduce the visual capability of fish in the study area’s aquatic habitats. This reduction in visual capacity could lead to a reduction in feeding and growth rates; a thickening of the gills, potentially causing the loss of respiratory function; the clogging and abrasion of gills; and increases in stress levels. These effects, in turn, could reduce the tolerance of fish to disease and toxicants, especially during low flows in the summer months, when background conditions would be expected to exhibit high water clarity (Waters 1995). Turbidity also could result in increased water temperature, especially in shallow quiet pools and during summer months, and affect dissolved oxygen (DO) concentrations. Both effects would place greater stress on fish respiration.

Also, high levels of suspended sediments could cause the movement and redistribution of fish populations, and could diminish the character and quality of the physical habitat important to fish survival. Once suspended sediment is deposited, it would reduce water depths in stream pools, decreasing the water's physical carrying capacity for juvenile and adult fish (Waters 1995). The pools provide important habitat to ensure survival during low-flow periods and are particularly sensitive to effects from sediment. Increased sediment loading would degrade food-producing habitat downstream of construction areas. Sediment loading would interfere with photosynthesis of aquatic flora and displace aquatic fauna. Many fish, including salmonids, are sight feeders, and turbid waters reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, could become disoriented and leave areas where their main food sources are located, ultimately reducing their growth rates. Prey (e.g., macroinvertebrates) of resident fish populations could be adversely affected by a decline in habitat (i.e., water quality conditions) caused by factors such as increased turbidity, decrease in DO content, or an increased level of pollutants or—although unlikely as a project effect—an extreme change in pH or water temperatures (Harrington and Born 2000). Decreases in the diversity and abundance of smaller organisms living on or in the sediments have been associated with smaller sediment grain sizes and the associated DO decreases in those sediments (Harrington and Born 2000).

Avoidance of adverse habitat conditions by fish is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas unsuitable for survival unless they have no other option. Therefore, if high turbidity were to result from construction activities, some fish species may be precluded from occupying habitat required for specific life stages. In some stream reaches, few opportunities for escape from turbid waters may be available, particularly during the summer season when flows are decreased and fish over-summer in smaller pools.

The potential exists for contaminants such as fuels, oils, other petroleum products, cement, and various chemicals used in construction activities to be accidentally introduced into the water system, either directly through spills or incrementally through surface runoff, from work within or immediately adjacent to the channel (see also Section 3.4, "Water Quality and Geomorphology"). In sufficient concentrations, contaminants would be toxic to fish occupying habitats in the study area or may alter oxygen diffusion rates and cause acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival. Trash, plastic bags, cans, tape, paper, wrapping material, and other solid wastes also could be deposited in streams and could entrap, injure, or otherwise be harmful to fish and other aquatic life.

Direct Disturbance and Temporary Loss of Habitat during Construction Activities

As described above, several aspects of project construction under Alternative 2 would require dewatering of the active channel to allow for access. These activities would occur during the low-flow summer months. The native fish and macroinvertebrate species occupying aquatic habitats could be injured or killed by heavy equipment during site access, preparation, or construction activities, if present in the affected area. Dewatering activities could cause these fish and macroinvertebrates to become stranded and could dry out their habitat or lead to predation by birds or mammals.

Project construction activities would also result in the temporary loss of riparian trees and shrubs that provide important shaded riverine aquatic habitat functions, such as shade, cover, complexity, and substrate for macroinvertebrates. (See Impact 3.5-3 [Alt. 2] for additional discussion of effects on riparian vegetation.)

Initial Channel Response

After the completion of construction activities, some habitat improvements associated with river ecosystem restoration activities and reconfiguration of the golf course would be realized immediately. For example, removing bridges and reconfiguring the golf course would result in fewer encroachments and other adverse effects on the SEZ. Restoration efforts would create a longer, more meandering channel and more connected riparian zone, resulting in increased habitat complexity, pool volume, and cover. Armored riffle substrates used in grade control could provide spawning substrate and would also provide habitat for aquatic macroinvertebrates. Water turbulence created by the armored riffles would provide increased DO concentrations, which is vital for many species of fish and macroinvertebrates.

The new physical form of the channel and associated floodplain would also result in immediate changes to hydraulic conditions, which in turn would result in a geomorphic response for some period of time until a new dynamic equilibrium was reached. Depending on the specific, localized circumstances (e.g., flows and channel geometry), this could include localized changes in water velocities, sediment transport, and depositional patterns. Because the geomorphic response is process driven and subject to several highly variable conditions (e.g., frequency, duration, and magnitude of intermediate- to high-flow events; local sediment grain sizes; local channel geometry), it can be extremely difficult to predict the nature and extent of short-term (interim) outcomes. Nevertheless, it is possible that some aquatic habitat conditions could become degraded during the channel's initial response to the changed physical condition. For example, initial channel responses could result in the formation of localized sediment deposits that disconnect surface water and physically interfere with fish movement during low-flow conditions. In addition, floodplain surface deposits (e.g., off-channel depressions) could form, which could lead to fish stranding after overbanking flow events. Additional discussion on the potential initial channel response is provided in Section 3.3, "Hydrology and Flooding," and Section 3.4, "Water Quality and Geomorphology."

Impact Summary

Project construction activities would occur for 3–4 years. Such activities could result in intermittently increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants. These would be potential short-term, temporary effects. Such exposure could reduce or adversely affect aquatic habitat and populations, including salmonids and other native aquatic species. Alternative 2 includes a suite of measures, including BMPs, that would minimize this potential effect. Construction would include dewatering activities that would result in the temporary loss of aquatic habitat. Fish and macroinvertebrates could become stranded during dewatering activities, and habitat could dry out or predation by birds or mammals could occur; or the organisms could be injured or killed by heavy equipment during site access, preparation, or construction activities. However, in the short term, implementing Alternative 2 could result in both adverse and beneficial effects on aquatic habitats, depending on the effects of the river channel's geomorphic response on sediment transport and deposition processes during the initial channel-response period. This impact would be significant.

Mitigation Measure 3.5-1A (Alt. 2): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.4-6 (Alt. 2) in Section 3.4, "Geomorphology and Water Quality."

Mitigation Measure 3.5-1B (Alt. 2): Implement Preconstruction Surveys for Western Pearlshell Mussels.

Before the initiation of construction activities, State Parks will survey for western pearlshell mussels to determine whether they are present. If it is determined that western pearlshell mussels are present in the study area, then specific measures will be included to address this species in the native-fish and mussel capture and translocation plan described in Mitigation Measure 3.5-1C (Alt. 2) below.

Mitigation Measure 3.5-1C (Alt. 2): Develop and Implement Native-Fish and Mussel Capture and Translocation Plan.

State Parks or its representative will develop and implement a measure to prevent the loss of native fish and mussel species occupying habitat within the study area. Before any construction activities that require dewatering commences, a CDFG-approved biologist will conduct native-fish and mussel relocation activities within the construction dewatering area. All captured native fish and mussel species will be immediately released to a suitable habitat near the study area. Future restoration should not be planned for the relocation site within the next few years to allow for reestablishment of habitat and coordination with other agencies (i.e., USFS, Conservancy, City of South Lake Tahoe) should be completed so all relocation is not occurring in one reach of the river. The qualified biologist will place nets with 1/8-inch mesh at the upstream and downstream extents of the area to be dewatered to keep fish out of the area during fish removal activities. After completion of removal activities, the work area will be cleared for dewatering. Fish rescue and relocation will continue until the area is completely dewatered or until it is determined that no fishes remain in the dewatering area. These activities will take place in consultation with CDFG.

Mitigation Measure 3.5-1D (Alt. 2): Limit Potential Localized Channel Erosion in the Upper Truckee River and Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-1A (Alt. 2) in Section 3.4, “Geomorphology and Water Quality.”

Mitigation Measure 3.5-1E (Alt. 2): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.4-1B (Alt. 2) in Section 3.4, “Geomorphology and Water Quality.”

Mitigation Measure 3.5-1F (Alt. 2): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

This mitigation measure is identical to Mitigation Measure 3.4-1C (Alt. 2) in Section 3.4, “Geomorphology and Water Quality.”

Mitigation Measure 3.5-1G (Alt. 2): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.4-1D (Alt. 2) in Section 3.4, “Geomorphology and Water Quality.”

Mitigation Measure 3.5-1H (Alt. 2): Monitor and Supplement Coarse-Sediment Delivery Downstream and Monitor Instream Habitat Conditions.

State Parks will implement Mitigation Measure 3.4-5 (Alt. 2) in Section 3.4, “Geomorphology and Water Quality.” In addition, State Parks will monitor instream habitat conditions for potential geomorphic response–related effects. Specifically, if sediment deposition is occurring within the study area that results in the loss of surface water connectivity and/or creates an impediment to fish movement in the low flow channel, State Parks will conclude that a project effect on fish movement/migration is occurring. In response, State Parks will regrade portions of the instream area to create a low-flow channel that restores surface water connectivity and fish movement/migration. State Parks will use BMPs similar to those described for the project alternatives and implement Mitigation Measures 3.5-1A (Alt. 2) through 3.5-1C (Alt. 2) to ensure that any subsequent adverse effects on fish habitat would be avoided and/or minimized.

With implementation of Mitigation Measures 3.5-1A (Alt. 2) through 3.5-1H (Alt. 2) as described above, potential short-term adverse effects on fish habitat would be avoided and/or minimized, or corrective actions would be implemented, and Impact 3.5-1 (Alt. 2) would be less than significant.

IMPACT 3.5-2 (Alt. 2) **Long-Term Changes to Fish and Aquatic Habitat.** *River restoration activities under Alternative 2 would result in long-term beneficial effects on aquatic habitats and the fish community in the Upper Truckee River. These beneficial effects would result from several changes: the removal of encroachments in the SEZ and channel; improved conditions for riffle and pool complexes and substrate through restored geomorphic processes; improved floodplain connectivity and access to secondary channels; increased habitat structure and complexity; and reduced sediment inputs into the river associated with existing, ongoing bank erosion. This effect would be* ***beneficial****.*

River restoration and reconfiguration of the golf course under Alternative 2 would substantially increase the length of the channel and width of the riparian corridor and would restore natural processes within the study area, resulting in higher quality and increased quantity habitat for the fish and macroinvertebrate community. Increased sinuosity would improve pool development and maintenance, and a wider and more rigorous riparian vegetation community would lead to increased riparian cover and instream complexity with the introduction of woody debris.

Pool habitats provide important functions for the native fish community. Pools provide deep, low-velocity areas, with submerged structural elements that provide cover (Moyle 2002, Raleigh et al. 1984), winter habitat, and flood and thermal refugia for fish. During upstream migrations, adult fish (including trout that have been foraging as adults in Lake Tahoe) typically move quickly through higher velocity riffles and rapids and pause for varying durations in deep holding pools. These holding pools provide safe areas in which fish can rest when low flows and/or fatigue inhibit their migration. Proposed restoration activities under Alternative 2 have the potential to result in beneficial effects on fundamental physical processes related to pool formation and maintenance. The partial sedimentation of pools during summer low-flow periods and their subsequent scour during spring-snowmelt high-flow periods are widely recognized seasonal processes. During high flows, coarse particles eroded from upstream riffles are transported through pools to downstream riffles. This process occurs because velocity and shear stress increase in pools at a faster rate than at riffles as flow increases toward bankfull (National Marine Fisheries Service 2004). As discharge increases, the energy to transport coarse sediment increases in pools at a faster rate than at riffles. A threshold is generally reached when flows approach the effective-discharge flow and the pool scour process begins, and coarse sediment eroded from upstream reaches continues through pools to downstream riffles where it may be deposited. The pool scour process becomes most dominant at the effective-discharge flow in undisturbed stream channels because flow depth increases only slightly once the adjacent bars or banks are overtopped and the floodplain is inundated (National Marine Fisheries Service 2004).

Restoration activities have the potential to increase the convergence of flows through pools, thereby increasing the effectiveness of the scour mechanisms that maintain pools. Reduced confinement of flows could be expressed as an increased width-to-depth ratio for the active channel. Restoring more natural hydraulic conditions and associated geomorphic processes has the potential to decrease width-to-depth ratios. As a result, pool formation and maintenance processes could be restored.

Reducing the channel gradient would allow increased storage of gravel bed load in the channel, with the development of riffles important for macroinvertebrate production, fish spawning, and water quality. Riffles provide many important habitat functions for salmonids and other fish species, including spawning areas for adults and rearing areas for juveniles. Important to these habitat functions are appropriately sized, stable gravels and cobbles with clear interstitial spaces (i.e., spaces free of fine sediments) for spawning and egg incubation, and habitat complexity with periodic coarse cobbles and boulders for juvenile rearing (providing localized velocity refugia [i.e., pockets] that serve as important feeding stations). In addition to providing habitat function for fish, riffles are turbulent water areas that are important for the maintenance of high DO concentrations in the water column and provide important habitat for benthic macroinvertebrates.

Benthic macroinvertebrates are the principal food source for most juvenile salmonids (Moyle 2002:40-41). Mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera), referred to collectively as EPT taxa, are considered the most productive, preferred, and available foods for stream fishes (Waters 1995). The EPT group typically inhabits the interstitial spaces of coarse substrates (i.e., gravel to cobble-sized particles), although some species of mayfly and certain other aquatic insects (e.g., chironomidae) prefer highly organic fine sediments. Sands and silt are the least productive substrates for aquatic macroinvertebrates (Harrington and Born 2000) and are more easily mobilized, making them less suitable because they are less stable. Therefore, reducing the intrusion of sediment that reduces the interstitial spaces of cobbles and gravel would directly increase the habitable area for these taxa. Changes in the biomass and structure of benthic macroinvertebrate assemblages could increase the vigor of native fish populations that depend on them.

Under Alternative 2, the golf course would be removed from most areas adjacent to the Upper Truckee River channel, and adjoining riparian vegetation communities would be restored. Approximately 97 acres of floodplain and meadow would be restored, including 37 acres of SEZ. The increased area and improved ecosystem functions of SEZ, floodplain, and riparian communities would be beneficial because they would result in a long-term net increase in instream cover, shade, and woody debris recruitment.

Impact Summary

Alterations in hydraulics and geomorphic processes have resulted in the creation of incised channels, followed by lateral erosion and widening. This ultimately has resulted in reduced aquatic habitat quality with a wider, more uniform channel section with less lateral variation in depth, and reduced convergence of flows that are necessary to maintain pool depth and volume. Alternative 2 would include restoration of the physical channel form, hydraulic conditions, and geomorphic processes. Many of the benefits of the restoration project would be realized over time, as functional geomorphic processes shape channel morphology and associated habitat features that provide important functions and values to the fish and macroinvertebrate community. For example, reduced streambank height and increased riparian vigor would allow the development of undercut streambanks, which provide important cover for fish. The cover provided by riparian vegetation would also increase as riparian vegetation matures. Colonization of floodplains, streambanks, and instream bars by riparian vegetation would result in variability in erosion resistance and would promote deposition in localized areas, increasing channel complexity. These processes, which rely on regular disturbance resulting from flood events, would result in improvements in aquatic habitat functions and values over a period of several decades, and would assure that aquatic habitat would be maintained over time. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-3 (Alt. 2)	Short-Term, Construction-Related Disturbance or Loss of Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ). *Implementing Alternative 2 would result in the removal of riparian and meadow vegetation along the Upper Truckee River and placement of fill into the active channel for geomorphic restoration of the river. Alternative 2 also includes golf course construction and wetland restoration in the vicinity of spring complexes in Washoe Meadows SP, including wetland restoration in the old quarry adjacent to the large fen, and could affect these complexes either directly or by changing local hydrology. The locations of the spring complexes are well-documented and Alternative 2 proposes to avoid these areas. However, because of the close proximity of the current conceptual design of golf course reconfiguration and quarry restoration to the spring complexes (including a fen), these complexes could be directly or indirectly affected by final project design, construction, and operation without more specific design parameters and measures to avoid direct or indirect effects on these sensitive resources. Because the likelihood and potential magnitude of these effects are presently unknown and Alternative 2 would result in disturbance within SEZ and jurisdictional wetlands this impact is considered* ***significant****.*

The stream channel's size, configuration, and floodplain connection would be directly modified throughout the study area under Alternative 2 by increasing channel length (adding 1,590 feet), elevating the streambed 2–4 feet in many locations, and reducing channel capacity in a majority of reaches. Modifications would also involve placing fill in approximately 2,600 feet of existing channel. Restoration would involve removing some existing riparian vegetation, but the riparian vegetation to be removed would be salvaged and used elsewhere to the extent feasible. Salvaged vegetation would consist of transplanted sod and shrubs, native sod revetments and native sod blankets, and woody debris brush boxes. Sod and shrub materials would be obtained from within the footprint of the new channels and salvaged from the bottom of reconnected meanders or from adjacent meadows (aside from landscaped areas with nonnative sod). As part of project design, in all near-bank areas that would experience construction disturbance, protecting the existing bank vegetation would be emphasized.

Other improvements proposed under Alternative 2 include the area where the old quarry pit cut into the hillside intercepting subsurface water, which drains to the base of the slope and forms a small wetland on the disturbed topography of the old quarry floor. This small wetland is part of the mapped spring complex on the wall and pit floor of the old quarry, located adjacent to and east of the large fen in Washoe Meadows SP. The drainage would be reconfigured to a more naturalized channel, and a wetland pond covering about 0.5 acre would be constructed to form a more natural habitat. This wetland pond would be outside of but adjacent to the golf course footprint. Drainage out of the pond would cross the golf course, requiring a small cart path bridge. The quarry restoration would require some disturbance to the existing wetlands, including hydrologic changes and vegetation disturbance. The existing disturbed wetland on the pit floor, which would be restored under Alternative 2, is hydrologically connected to and receives drainage from the large fen to the west via a small rivulet as well as being fed by groundwater. Although Alternative 2 proposes to avoid the fen, wetland restoration and drainage reconfiguration in the quarry could inadvertently alter the groundwater or surface water hydrology and availability for the fen upslope. A risk would exist that drainage from the fen could potentially increase and cause the fen to become drier if landscape alteration downslope of the fen modifies groundwater flow. Because the proposed restoration in the quarry is conceptual, the specific potential for and magnitude of this effect cannot presently be known.

Two areas mapped as spring complexes are located adjacent to the location of the reconfigured golf course holes and fairways proposed under Alternative 2: (1) the groundwater-supported wetland mosaic in the old quarry (located on the quarry high wall and part of the pit floor on the west side of the quarry), adjacent to and east of the large fen; and (2) the spring and associated wetland vegetation at the south end of the park. The wetland mosaic in the old quarry (which includes the small wetland that would be restored under Alternative 2, as previously discussed) is located adjacent to the proposed tee box, fairway, and green for hole 12. The spring and associated wetland vegetation at the south end of the park is adjacent to the proposed golf course holes 9, 10, and 11. Alternative 2 proposes to avoid direct effects on spring complexes by designing the layout of the golf course around or away from these areas and by including a protective buffer. Because the design of the golf course holes is conceptual and not finalized, potential for the final design, construction, and operation of these holes to inadvertently degrade this sensitive biological resource exists without more specific design parameters and measures to avoid direct or indirect effects on the spring complexes.

Wetland habitat has been adequately identified for purposes of the EIR/EIS/EIS using vegetation as the primary indicator and hydrology, where it is apparent. While this approach would encompass all wetland areas ultimately confirmed to be protected under the CWA, a formal delineation of jurisdictional wetlands subject to USACE jurisdiction under Section 404 of the CWA (i.e., using vegetation, hydrology, and soils as indicators) would not be conducted until the permitting phase after selection of a preferred alternative. The Upper Truckee River is considered a water of the United States. As mentioned in the "Methods and Assumptions" section of this impact analysis, habitat types associated with the riparian corridor of the Upper Truckee River, Angora Creek, the other unnamed creek drainages within the study area, and potentially the quarry ponds are assumed to be considered jurisdictional wetlands, subject to USACE jurisdiction under CWA Section 404. These habitat types are also considered habitats of special significance by TRPA. Deciduous riparian vegetation (willow scrub) and montane meadow vegetation are two of TRPA's threshold common vegetation types. Implementation of Alternative 2 would involve removing riparian vegetation and working within areas that would qualify as jurisdictional wetlands and other waters of the United States and SEZ. The project would require a CWA Section 404 permit from USACE (i.e., Regional General Permit 16), a CWA section 401 permit from the RWQCB, and streambed alteration agreement from CDFG for work on the streambed and banks of the Upper Truckee River, Angora Creek, and the other unnamed creek drainages within the study area. Geomorphic restoration under Alternative 2 would include placement of fill in the Upper Truckee River and removal of some adjacent woody riparian and meadow vegetation. This would result in the temporary disturbance of sensitive habitat types, including SEZ, and the placement of fill material into jurisdictional waters of the United States, including wetlands subject to USACE jurisdiction under CWA Section 404.

Because the likelihood and magnitude of the potential effects on the spring complex hydrology are presently unknown and Alternative 2 would result in disturbance within SEZ and jurisdictional wetland, this impact is considered significant.

Mitigation Measure 3.5-3A (Alt. 2): Conduct Delineation of Waters of the United States and Obtain Authorization for Fill and Required Permits.

Before approval of detailed design used for project construction, a delineation of waters of the United States, including wetlands that would be affected by project implementation, will be conducted by a qualified biologist through the formal Section 404 wetland delineation process. The delineation will be submitted to and verified by the Sacramento District of USACE. Authorization for fill or reconstruction of jurisdictional waters of the United States, including wetlands, will be secured from the Sacramento District of USACE through the Section 404 permitting process. Because the project involves wetland and stream restoration activities in the Tahoe Basin, it is anticipated that the project would be authorized under Regional General Permit 16. This permit requires the following general permit terms:

- a determination of the volume and types of material to be placed into waters of the United States;
- a determination of the total area of waters of the United States to be directly and indirectly affected;
- a wetland delineation in accordance with the 1987 *Wetland Delineation Manual* and the *Western Mountain Regional Supplement* (USACE 2008) when wetlands are proposed for impacts;
- a description of habitat, including plant communities, located in the study area;
- a description of any environmental impacts that are expected to occur, including methods to avoid, minimize, or mitigate adverse impacts on water quality or aquatic functions at the study area;
- any other information pertinent to the wetland, stream or water body involved;
- for projects involving the restoration of greater than 3 acres of wetlands, evidence that USFWS has been provided with a courtesy copy of the project notification; and
- a copy of the 401 water quality certification or waiver issued for the project.

State Parks will coordinate with USACE as appropriate and obtain coverage under Regional General Permit 16 for the construction of all aspects of the project. All general terms required for permit compliance will be implemented.

In addition, implementation of Alternative 2 would require a streambed alteration agreement from CDFG for work on the bed and banks of the Upper Truckee River. State Parks will obtain the streambed alteration agreement from CDFG and implement all terms required for permit compliance.

Mitigation Measure 3.5-3B (Alt. 2): Implement Vegetation Protection Measures and Revegetate Disturbed Areas.

To minimize the loss of native wetland vegetation at the site, salvage actions will be implemented for wet meadow and riparian vegetation. As detailed in Chapter 2, "Project Alternatives," and mentioned in the impact discussion, riparian vegetation within the SEZ would be avoided to greatest extent feasible. A minimum number of channel access points will be used to avoid and minimize adverse effects on bank vegetation. If avoidance is not possible, trees will be shielded, and shrubs will be pruned while protecting soil and root structures. In areas where existing streambank vegetation must be removed, plant materials will be salvaged, stored, and reused as possible.

Mitigation Measure 3.5-3C (Alt. 2): Avoid Effects on the Spring Complexes (Including Fens) through Final Project Design and Implement Protection Measures During Project Construction.

To avoid potential adverse effects of golf course relocation and operation on the spring complexes west of the Upper Truckee River, and potential effects of quarry restoration on the large fen adjacent to and west of the quarry, the following mitigation measures will be implemented.

(1) State Parks will develop and implement specific parameters and measures to ensure that the final design, operation, and management of golf course holes 9, 10, 11, and 12 avoid potential direct and indirect impacts to the spring complexes in Washoe Meadows SP.

(2) Before construction, a qualified biologist will clearly identify the boundaries of the relevant spring complexes in the field with flagging, and protective fencing will be placed around the features to protect them from project-related effects. No construction-related activities will be allowed within areas fenced for avoidance, and construction personnel will be briefed about the presence of this sensitive resource and the need to avoid impacts to it.

(3) The edges of the spring complexes will be further protected from indirect effects of the managed turf by the “naturalized landscape” and “minimally managed landscape” buffer areas that are part of the project design. The latter, which will function as the ultimate buffer between the golf course and the adjacent native vegetation, will be areas of native vegetation within the golf course that are generally not mowed, irrigated, or fertilized. Vegetation height and structure may be managed (trim, thin, etc.) to enhance course playability, but in general these areas will serve to buffer the spring complexes from indirect effects of the golf course management.

(4) Proposed restoration of the quarry will be further designed to avoid potential direct or indirect effects on the large fen west of the quarry. The plans and specifications will ensure that the groundwater and surface water hydrology that support the fen will not be adversely affected by the project.

With the measures described above, the locations of sensitive habitats would be identified, and the project would minimize effects of project construction and compensate for loss of sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ); potential impacts to the spring complexes as a result of golf course relocation and operation would be avoided through final project design of the golf course holes, installation of protective fencing, and training of construction crews; and potential effects of quarry restoration on the large fen west of the quarry would be avoided through final restoration design that avoids potential hydrologic impacts to the fen. Therefore, with implementation of Mitigation Measures 3.5-3A (Alt. 2), 3.5-3B (Alt. 2), and 3.5-3C (Alt. 2), Impact 3.5-3 (Alt. 2) would be less than significant.

IMPACT 3.5-4 (Alt. 2)	**Short-Term, Construction-Related Disturbance or Removal of Special-Status Plants.** *Alternative 2 would involve temporary disturbance and removal of plant communities that provide suitable habitat for several special-status plant species known to occur in the vicinity of the study area. While surveys to date have not detected these species in proposed construction areas, pre-construction, focused surveys would be conducted to confirm absence during the permitting phase. Because suitable habitat exists where ground disturbance is planned, if special-status plant species are found in follow-up, pre-construction surveys, then implementing Alternative 2 could result in their removal or disturbance. This impact would be* ***potentially significant****.*

Several special-status plant species are known to occur in and adjacent to the study area or have potential to occur in the study area. Suitable habitat for these species within the study area exists in mesic conditions along the Upper Truckee River and in the spring complexes west of the river. Some of these species, specifically shore sedge and three-ranked hump-moss, are known to occur in the large fen in Washoe Meadows SP. Shore sedge and three-ranked hump-moss could also occur in other spring complexes in the study area, including the small wetland in the old quarry that would be restored under Alternative 2. Two special-status vascular plant species, marsh skullcap and Oregon fireweed, and one special-status moss species, Bolander's candle moss, could occur in moist riparian habitats that are suitable for the species along the Upper Truckee River, Angora Creek, and the unnamed creek within the existing golf course, and in spring complexes west of the river. Marsh skullcap has been documented just outside the study area in Washoe Meadows SP, where it is found along a creek channel in an open meadow growing with sedges and mint. Similar conditions and associated plant species occur along the Upper Truckee River and other drainages in the study area. Oregon fireweed and Bolander's candle moss have not been documented in the vicinity of the study area, but are known to occur under similar conditions elsewhere in the Tahoe Basin. Although special-status plant species have been documented or could occur in the study area, none have been identified during any vegetation monitoring or rare-plant surveys, or otherwise documented, within proposed construction areas to date. However, pre-construction, focused surveys would be conducted to confirm absence prior to implementation. Because suitable habitat exists in locations where ground-disturbing activities would be implemented, marsh skullcap, Oregon fireweed, Bolander's candle moss, shore sedge, three-ranked hump-moss could be found in proposed construction areas during follow-up, pre-construction surveys and adversely affected by implementation of Alternative 2.

Alternative 2 involves restoring a 13,430-foot stretch of the Upper Truckee River and adjoining floodplain, including the removal of the five existing bridges and the construction of one new, longer bridge. Activities associated with the geomorphic restoration would entail local, temporary disturbances to the existing vegetation to restore natural geomorphic processes. Also, the quarry wetland restoration and pond construction would require some vegetation disturbance and hydrologic changes to the existing wetlands (see Impact 3.5-3 [Alt.2] for further discussion), which provide suitable habitat for special-status plants. Under this alternative, 97 acres of floodplain and meadow would be restored, including 39 acres of the 100-year floodplain and 37 acres of SEZ, all of which could provide suitable habitat for marsh skullcap, Oregon fireweed, and Bolander's candle moss in the future. Where marsh skullcap occurs in Washoe Meadows SP, it has responded favorably to stream restoration along Angora Creek with an increase in growth after restoration; therefore, long-term effects of the project could be beneficial. However, if populations of these special-status species exist in portions of the Upper Truckee River riparian corridor or the quarry wetlands that would be disturbed during implementation of Alternative 2, construction activities could have a substantial short-term adverse effect on special-status species. This impact would be potentially significant.

Implementing Alternative 2 also involves reconfiguring the Lake Tahoe Golf Course by fully relocating seven golf course holes and partially relocating two holes to the west side of the Upper Truckee River. Vegetation within the conceptual golf course footprint is mapped primarily as lodgepole pine forest with a dry understory, Jeffrey pine forest, dry meadow, and sagebrush dry meadow. These habitat types are not considered suitable habitat for special-status plant species with potential to occur in the study area. In addition, the native vegetation in this portion of the relocated footprint has been disturbed and degraded by historic quarry mining activities. The ephemeral drainages in the southwest corner of the study area that would fall within the footprint of the reconfigured golf course holes are also not considered habitat for these species because they do not convey perennial water and lack established riparian vegetation. Because these species are not expected to inhabit this portion of the study area, relocating the golf course holes is not expected to affect special-status plant species.

Mitigation Measure 3.5-4 (Alt. 2): Conduct Follow-up, Pre-construction, Focused Surveys and Avoid, Minimize, or Compensate for Impacts on Special-Status Plants.

To avoid, minimize, or compensate for possible adverse effects on special-status plant species resulting from the proposed restoration of the Upper Truckee River or quarry wetlands, the following management requirements would be implemented in the following order:

(1) A qualified botanist familiar with the vegetation of the Tahoe Basin will conduct a focused preconstruction survey for special-status plants (e.g., marsh skullcap, Oregon fireweed, Bolander's candle moss) along all portions of the Upper Truckee River where construction (e.g., geomorphic restoration, bridge construction) is proposed. Preconstruction surveys will also be conducted at the quarry wetlands for special-status plants that could occur there and be affected by proposed wetland restoration in the quarry (e.g., three-ranked hump-moss, shore sedge, Bolander's candle moss, marsh skullcap, and other special-status plants associated with mesic conditions). Surveys will be conducted between June and September when target species are clearly identifiable and will follow CDFG's *Guidelines for Assessing the Effects of Proposed Development on Rare, Threatened, and Endangered Plants and Plant Communities* (CDFG 2000).

(2) If no special-status plants are found during the survey, the results of the survey will be documented in a letter report to the lead agencies that would become part of the project environmental record, and no further actions will be required.

(3) If occurrences of special-status plants are documented during the survey, they will be clearly identified in the field and protected from impacts associated with construction activities. Protective measures will include flagging and fencing of known plant locations and avoidance where possible. No construction-related activities will be allowed within areas fenced for avoidance, and construction personnel will be briefed about the presence of the plants and need to avoid effects on the populations.

(4) If avoidance is not possible, a mitigation plan to reduce impacts on special-status plants to a less-than-significant level will be developed in coordination with the lead agencies, CDFG (for CNPS List 2 species), and USFS (for forest sensitive species), depending on the species affected. The mitigation plan will include provisions for minimizing impacts on special-status plant populations during construction and for relocation and establishment of plants at new protected locations in the study area. The mitigation plan will also include provisions for follow-up monitoring to determine mitigation success, and remedial measures should the initial efforts to mitigate fail. The plan will be adopted and implemented by State Parks.

With the measures described above, any special-status plants that may be present within areas of ground disturbance would be identified before construction and the project would avoid, minimize, and compensate for potential construction-related impacts on those species. Therefore, with implementation of Mitigation Measure 3.5-4 (Alt. 2), Impact 3.5-4 (Alt. 2) would be less than significant.

IMPACT 3.5-5 (Alt. 2)	**Long-Term Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens and SEZ) and Special-Status Plant Species.** *The long-term goal of the project under Alternative 2 is to minimize the footprint of the golf course within the SEZ, and to increase floodplain meadow vegetation as well as wetland area and functions. Implementing Alternative 2 would restore approximately 97 acres of floodplain vegetation and result in a net increase of 37 acres of restored SEZ. Restored floodplain and SEZ would also provide suitable habitat for the special-status plant species that have the potential to occur in the area. Because of the increased area and improved ecosystem functions of SEZ, floodplain, and wetland communities, this effect would be* ***beneficial****.*

Under Alternative 2 the golf course would be removed from most areas adjacent to the Upper Truckee River channel, and adjoining riparian vegetation communities would be restored. Approximately 97 acres of floodplain and meadow would be restored. Golf course holes would be relocated to an area on the west side of the river, farther from the river, that contains less sensitive land; this would reduce the amount of SEZ occupied by the golf course. A total of 37 acres of SEZ would be restored. In addition, drainage around the area occupied by the old quarry pit on the west side of the Upper Truckee River would be improved and would include the creation of a natural channel and a wetland pond covering about 0.5 acre. As discusses under Impact 3.5-4 (Alt 2) the fen and other spring complexes outside of the disturbed quarry area would not be affected by the project. The restoration approach is designed to reverse the negative trends of erosion caused by past channelization, existing infrastructure, and associated land uses. The increased area and improved ecosystem functions of SEZ, floodplain, and wetland communities would be beneficial because they would result in a long-term net increase in the acreage of sensitive habitats (wetlands, riparian vegetation, and SEZ).

In addition, areas of restored SEZ and floodplain meadow vegetation would increase the area of suitable habitat for special-status plant species that have the potential to occur within the area. Marsh skullcap, Oregon fireweed, and Bolander's candle moss, discussed under Impact 3.5-4 (Alt. 2), have potential to occur in moist riparian habitats and would benefit from the long-term increase in this habitat type. A nearby population of marsh skullcap in Washoe Meadows SP responded favorably to a restoration project along Angora Creek and grows vigorously along the newly created banks of that creek. The increased size of SEZ, floodplain, and wetland communities could provide additional habitat for these species. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-6 (Alt. 2)	Tree Removal and Forest Land Conversion. *Implementing Alternative 2 would result in the loss of an estimated 1,640 native trees greater than 10 inches DBH, including 1,395 trees in the area proposed for golf course relocation, 120 trees for geomorphic restoration, and 125 trees for access road construction. The relocation of a portion of the golf course to the west side of the river would involve conversion of forest to non-forest use (approximately 45 acres). This preliminary estimate of trees removed includes three trees greater than 30 inches DBH. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The magnitude of proposed tree removal in the study area is considered "substantial" as defined in the TRPA Code of Ordinances. However, tree removal will not affect any old growth forests. Implementing Alternative 2 would require a tree removal and management plan developed with TRPA. Substantial tree removal and the loss of trees greater than 30 inches DBH would be a* ***significant*** *impact.*

Implementing Alternative 2 would involve reconfiguring the Lake Tahoe Golf Course by fully relocating seven golf course holes and partially relocating two holes to the west side of the Upper Truckee River. The relocated golf course would be moved to higher capability lands farther from the river to minimize the use of SEZ lands and avoid sensitive biological resources in Washoe Meadows SP. The layout for the relocated holes would be designed to minimize removal of trees by maximizing placement of new holes in relatively open and previously disturbed areas. All trees would be removed from proposed tees, greens, and fairways; approximately 80 percent of trees located in the proposed rough would be removed. Approximately 45 acres mapped as Jeffrey pine and lodgepole pine would be removed to develop the relocated golf holes. For purposes of this EIR/EIS/EIS, the relocation of the golf course holes would require conversion of these 45 acres of mapped pine forest to non-forest uses. However, much of this acreage includes disturbed habitat on the old quarry lands that now support small trees, and dense lodgepole pine cover that is encroaching into meadows and riparian areas.Some tree removal from riparian areas would also be required for access to the river and geomorphic restoration under Alternative 2. However, as a result of geomorphic, floodplain, and SEZ restoration, a net increase in riparian tree abundance, cover, and productivity is expected following project implementation.

Under Alternative 2, an estimated total of 1,640 trees greater than 10 inches DBH would be removed, including 1,395 trees for golf course relocation, 120 trees for geomorphic restoration, and 125 trees for access road construction. This estimate includes three trees greater than 30 inches DBH, with at least one tree greater than 30 inches DBH within the proposed golf course footprint and two trees greater than 30 inches DBH that would be removed for geomorphic restoration. However, trees to be removed under Alternative 2 will not affect an old growth forest. Tree removal estimates were calculated by State Parks based on an estimate of tree density (number of trees per acre) that is typical in the study area for each of the vegetation types that would be affected (130 trees per acre for lodgepole pine/moist understory, 75 trees per acre for lodgepole pine/dry understory, 90 trees per acre for Jeffrey pine, 38 trees per acre for lodgepole pine/dry meadow, and 8 trees per acre for meadow types) combined with the acreage of each vegetation type affected. Trees greater than 30 inches DBH were located during field reconnaissance. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The tree removal estimates reflect tree thinning recently completed by State Parks for fuels management treatments. Much of the study area has been treated for fuels management and forest health at least once-(Walck, pers. comm., 2010).

The tree removal estimates for Alternative 2 include trees that may be removed in the future for additional forest health and fuels treatments prior to, or in the absence of, project implementation, as part of State Parks' existing Lake Sector Wildfire Management Plan. Although State Parks has treated much of the study area for fuels reduction, some proportion of trees estimated for removal under Alternative 2 may be removed in the future regardless of project implementation (Walck, pers. comm., 2010), to further reduce densities in some areas. Additionally, some lodgepole pines that would be removed within the riparian corridor as part of the geomorphic restoration under Alternative 2 would also be removed as part of State Parks' existing management objectives to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project).

As previously discussed, approximately 45 acres mapped as Jeffrey pine and lodgepole pine would be converted to golf course, including area previously disturbed by the old quarry. As a result of geomorphic, floodplain, and SEZ restoration, a net increase in riparian tree cover and productivity would occur under Alternative 2. Effects of this conifer forest conversion and increase in riparian vegetation on common and sensitive biological resources as a result of Alternative 2 are discussed below in Impacts 3.5-8 (Alt. 2), 3.5-9 (Alt. 2), and 3.5-10 (Alt. 2). Implications of this conifer forest conversion and increase in riparian vegetation for forest carbon cycling and climate change are discussed in Section 3.16, "Cumulative Impacts."

Provisions for tree removal are provided in the TRPA Code of Ordinances (Chapter 71, and Chapters 30, 65, 75, and 77), and tree removal requires the review and approval of TRPA. TRPA defines "substantial" tree removal as "activities on project areas of twenty acres or more and proposing the removal of more than 100 live trees 10 inches DBH or larger, or proposing the removal of more than 100 live trees 10 inches DBH or larger within land capability districts 1a, 1b, 1c, 2, or 3 regardless of the project area, or proposing tree removal that, as determined by TRPA after a joint inspection with appropriate State or Federal forestry staff, does not meet the minimum acceptable stocking standards set forth in Subsection 71.4.B" (TRPA Code of Ordinances, Section 71.4.I). Additionally, trees greater than 30 inches DBH must be retained, except under circumstances specified in the Code of Ordinances.

The magnitude of estimated tree removal (1,640 native trees greater than 10 inches DBH) under Alternative 2 would be substantial as defined by TRPA, and approximately three trees greater than 30 inches DBH would be removed. This impact would be significant.

Mitigation Measure 3.5-6 (Alt. 2): Minimize Tree Removal and Develop a Tree Removal and Management Plan.

Where feasible, the project will avoid and minimize the removal of trees, especially those 30 inches in DBH or larger. This avoidance and minimization will be achieved through project design to the greatest extent feasible. Tree removal that cannot be avoided will be mitigated with the following measures.

In accordance with Chapter 71, Section 71.3.B of the TRPA Code of Ordinances, a tree removal and management plan will be prepared by a qualified environmental professional (i.e., a restoration specialist, registered professional forester [RPF], or certified arborist with restoration qualifications, or similar qualified professional), and will be submitted to a TRPA RPF or other qualified TRPA professional for review and approval. TRPA approval of the plan will be obtained before project approval. Alternatively, if a timber harvesting plan is required to be submitted to California Department of Forestry and Fire Protection and meets the requirements described in this mitigation measure, the timber harvesting plan may be submitted to TRPA for review and approval in lieu of a separate tree removal and management plan.

The tree removal and management plan will adhere to the provisions in Chapter 71 of the TRPA Code of Ordinances, including the preservation of trees larger than 30 inches DBH (Section 71.2.A). The plan will include protection measures for snags and coarse woody debris. In accordance with the TRPA criteria *Standards for Common Vegetation*, the plan will maintain relative species richness, relative abundance, and relative age class, as appropriate and feasible, to contribute to the attainment of the regionwide threshold standard.

Permanent disturbance (i.e., disturbance after project construction caused by the proposed land use changes) and temporary disturbance (i.e., disturbance from construction activities) of all trees to be preserved will be minimized. This will include minimizing cuts, fills, grade changes, paving or other coverage, soil compaction, and landscaping effects within the critical root zone of all trees, as determined by a qualified environmental professional. Creation of detailed site plans and construction documents will be coordinated with a qualified environmental professional to minimize permanent and temporary disturbance. The tree removal and management plan will demonstrate how site development design will minimize the permanent disturbance of all trees to be preserved, and how construction planning will minimize temporary disturbance of all trees to be preserved.

To minimize temporary disturbance, the tree removal and management plan will provide for vegetation protection during construction in accordance with Chapters 65 and 30 of the TRPA Code of Ordinances. Protection measures will include the following, at a minimum:

- Sturdy high-visibility protective fencing will be installed at the limits of construction (including all grading, road improvements, underground utilities, staging, storage, parking, or other development activity), and outside of the critical root zone of all trees to be preserved that have critical root zones in the limits of construction. The critical root zone is defined here as the area 5 times the diameter of the tree. This fencing will be included on all site plans (e.g., staging, grading, drainage, and utility plans) and will be depicted in the tree removal and management plan.

- If grading, trenching, or transplanting is necessary within the root zone of trees to be preserved, the work will be supervised by a qualified environmental professional, a RPF, or another qualified biologist, and the following measures will be implemented:

  - Soil will be removed in lines radial to, rather than tangential to, the tree to avoid excessive ripping and shattering of roots.

  - If root cutting cannot be avoided, roots will be cut cleanly at a 90-degree angle.

  - A minimum of 6 inches of soil or sand will be placed over exposed cuts and roots to reduce soil desiccation until the area is backfilled.

  - Native soil will be used to backfill all cuts.

- All necessary pruning will be performed under the supervision of a certified arborist or RPF or similar qualified specialist.

All tree protection obligations required in the tree removal and management plan will be incorporated into construction contracts. Tree protection measures will be installed, and will be inspected by staff from TRPA before issuance of a grading permit.

As part of the tree removal and management plan, a tree replacement plan may be prepared by a qualified environmental professional, in accordance with Chapters 30 and 77 of the TRPA Code of Ordinances. Tree replacement needs and specifications will be determined in cooperation with TRPA during development of the tree removal and management plan. Determining whether tree replacement is appropriate, and the amount of project-related tree removal subject to mitigation by tree replacement, should be based on several considerations related to local and Basin-wide vegetation and fuels management goals and opportunities. These considerations include: (1) the condition, stocking level, and encroachment potential of stands where trees would be removed relative to vegetation/fuels management objectives, desired ecological conditions, and relevant TRPA thresholds for those areas (e.g., stands proposed for removal that are presently overstocked, encroaching into other native vegetation types, or otherwise undesirable may not warrant full replacement); (2) whether on- or off-site tree replacement, which could increase tree density and cover at replanting sites, would either contribute to or conflict with fuels/vegetation and forest health goals for those locations or Basin-wide; and (3) how tree replacement may affect attainment of TRPA thresholds for vegetation. If a tree replacement plan is required, it would be submitted to and approved by a TRPA RPF or other qualified TRPA professional before tree removal or the issuance of a grading permit. Tree replacement will only be implemented in a manner that is also consistent with fire fuel management objectives for the replanted properties.

If tree replacement is required, the following provisions shall be incorporated into the tree replacement plan.

- The tree replacement plan will include a plant list, a description of appropriate planting stock for new trees, a planting plan, planting and maintenance techniques, and measures to control the introduction or spread of invasive plants. Transplanting will follow the International Society of Arboriculture’s standard digging and transplanting techniques to ensure proper handling and successful transplanting of trees and vegetation.

- All trees planted to offset project impacts will be monitored for a period of at least 5 years, in conjunction with the monitoring program described below. Any tree that does not survive will be replaced on a 1:1 basis, and likewise monitored for a period of 5 years.

- Tree replacement may occur on-site if remaining undeveloped project areas can support additional trees, as determined by a qualified environmental professional and consistent with fire fuel management objectives. If the remaining undeveloped project areas cannot support sufficient plantings, off-site replacement will be required. Off-site replacement will occur in areas in need of additional trees, will be located as close to the study area as possible, and will be preserved in perpetuity by a conservation easement, deed restriction, or other similar mechanism.

- A certified arborist, a RPF, or qualified biologist will inspect the results of construction activities to document which trees were removed by grading and construction, and to document disturbance of preserved trees. This documentation will be provided to TRPA, and the total number of trees to be replanted, as described in the tree replacement plan, will be modified as necessary to reflect the actual tree removal and disturbance that occurs during construction.

- A vegetation monitoring approach will be developed and included as part of the tree replacement plan. Monitoring will be implemented by a certified arborist, a RPF, or another qualified biologist, for areas to be revegetated as mitigation. This approach will include monitoring protocols, including the protocol for evaluating tree health and vigor. A monitoring report detailing vegetation success will be submitted annually to TRPA through the monitoring period, for a minimum period of 5 years. The mitigation and monitoring of a replaced tree will continue until the tree satisfies the criteria for a successfully established sapling, dies, or is otherwise no longer part of a mitigation effort. Criteria for successful establishment will include survivorship for a period of at least 5 years, with at least 2 years without supplemental watering.

With the measure described above, the project would minimize tree removal and compensate, as needed, for the loss of trees. Therefore, with implementation of Mitigation Measure 3.5-6 (Alt. 2), Impact 3.5-6 (Alt. 2) would be less than significant.

IMPACT 3.5-7 (Alt. 2) **Introduction and Spread of Weeds and Aquatic Invasive Species.** *Implementing Alternative 2 has the potential to introduce and spread invasive weeds and aquatic invasive species during project construction and revegetation periods. The introduction and spread of invasive weeds or aquatic invasive species would degrade plant and wildlife habitat, including habitats of special significance (riparian) within the study area. In the long term, the new golf course area on the west side of the Upper Truckee River could provide a new source of nonnative plant and invasive weed populations that could colonize native vegetation nearby. However, implementation of the golf course's existing weed management plan would continue and would sufficiently prevent the spread of nonnative plants within areas of native vegetation during operation of the golf course. Introduction and spread of invasive weeds and aquatic invasive species during construction and revegetation would be a* ***potentially significant*** *impact.*

Implementing Alternative 2 would involve temporary ground-disturbing activities along stretches of the Upper Truckee River proposed for the geomorphic restoration and removal of portions of the existing golf course, as well as approximately 60 acres of previously disturbed Jeffrey pine, lodgepole pine, and other vegetation types for the reconfigured golf course. These ground-disturbing activities could result in the inadvertent introduction and/or spread of nonnative, invasive weed species. In addition, Alternative 2 would involve restoring a 13,430-foot-long reach of the Upper Truckee River and the replacement of five bridges with one longer bridge. These activities in and near the Upper Truckee River could spread aquatic invasive species into the Upper Truckee River. Waders or boots for construction personnel could harbor aquatic invasives such as New Zealand mudsnail, if that equipment has been exposed to those species in another water body, and is not sufficiently cleaned and sanitized. Nonnative, invasive weeds and nonnative aquatic invasive species compete with native plant and animal species; their introduction and proliferation in ecosystems can substantially alter the dynamics of native aquatic and terrestrial communities. This conversion can indirectly affect associated wildlife and fish species by changing and often reducing food sources and habitat structure and can lead to competition between native plant species and the weeds, often resulting in loss of native vegetation. The TRPA Goals and Policies specifically prohibit the release of nonnative plant and animal species in the Tahoe Basin because they can invade important wildlife habitats and compete for resources. However, invasive weeds and aquatic invasive species can be introduced inadvertently during grading and construction activities when construction equipment is moved into a site from another area where populations of weeds or aquatic invasive species occur.

Invasive weed species often are better competitors than native species, particularly in areas where the ground has been disturbed. Therefore, ground disturbance from construction activities could increase the local distribution and abundance of invasive weeds. An extensive weed survey has not been conducted for the Lake Valley SRA or Washoe Meadows SP, but two species on the USFS LTBMU's list of priority noxious weeds in the Tahoe Basin, cheatgrass (*Bromus tectorum*) and bull thistle (*Cirsium vulgare*), occur within Washoe Meadows SP. Furthermore, construction equipment entering the study area from weed-infested areas could result in the transport and spread of weeds. The geomorphic restoration of the Upper Truckee River and the construction of the reconfigured golf course west of the Upper Truckee River would temporarily create areas of open ground that could be colonized by weed species. Some of the generalized construction BMPs included in Chapter 2, "Project Alternatives," such as mulching and hydroseeding, would reduce the potential effects from weeds by reducing the amount of open ground. Without mitigation to address the introduction and spread of weeds, however, this short-term, construction-related impact would be potentially significant.

The relocated golf holes on the west side of the Upper Truckee River could provide a new source of nonnative plant and invasive weed populations in Washoe Meadows SP that could colonize native vegetation nearby. Additionally, although Alternative 2 involves removing existing golf course coverage within the SEZ along the Upper Truckee River (and restoring those areas to native vegetation), which could reduce the risk of weed invasion risk in the SEZ in localized areas, the overall golf course footprint would increase (from 133 acres to 156 acres). This includes areas of native vegetation such as areas of "naturalized landscape" that surround all of the areas of intensively and minimally managed landscape, which would serve as buffers against the spread of nonnative plant species from the golf course areas into the surrounding native vegetation. After development of the golf course on the west side of the river, implementing the golf course's existing weed management plan (see Chapter 2, "Project Alternatives") is expected to sufficiently prevent the spread of nonnative plants within the intensively managed and minimally managed landscaped areas into adjacent areas of native vegetation. The weed management plan implemented by the golf course as part of its routine maintenance would prevent the spread of weeds from areas within the existing golf course that would remain golf course under Alternative 2.

Mitigation Measure 3.5-7A (Alt. 2): Implement Weed Management Practices during Project Construction.

In consultation with TRPA, State Parks or its representative will implement appropriate weed management practices during project construction. Recommended practices include the following:

- A qualified biologist with experience in the Tahoe Basin will conduct a preconstruction survey to determine whether any populations of invasive/noxious weeds are present within areas proposed for ground-disturbing activities. This could be conducted in coordination with the focused special-status plant survey recommended above under Mitigation Measure 3.5-4 (Alt. 2), "Conduct Follow-up, Pre-construction, Focused Surveys and Avoid, Minimize, or Compensate for Impacts on Special-Status Plants." If noxious weed species are documented, they will be removed or their spread otherwise prevented before the start of construction. Control measures may include herbicide application, hand removal, or other means of mechanical control. This would help eliminate the threat of spreading the species throughout the study area and adjacent areas.

- All equipment entering the study area from weed-infested areas or areas of unknown weed status will be cleaned of all attached soil or plant parts before being allowed into the study area.

- To ensure that fill material and seeds imported to the study area are free of invasive/noxious weeds, the project will use on-site sources of fill and seeds whenever available. Fill and seed materials that need to be imported to the study area will be certified weed-free. In addition, only certified weed-free imported materials (or rice straw in upland areas) will be used for erosion control.

After project construction, the study area will be monitored on an annual basis for infestations of invasive weeds until the restored vegetation has become fully established. If new populations of invasive weeds are documented during monitoring, they will be treated and eradicated to prevent further spread. Emphasis in monitoring will be given to those areas designated as "minimally managed landscape" and "naturalized landscape" that serve as a buffer between the newly created golf course holes west of the Upper Truckee river and adjacent forest and riparian vegetation to ensure that these areas do not act as source points for infestations of weeds.

Mitigation Measure 3.5-7B (Alt. 2): Implement Aquatic Invasive Species Management Practices during Project Construction.

In consultation with TRPA, State Parks or its representative will implement appropriate aquatic invasive species management practices during project construction. Recommended practices include the following:

- All equipment, including individual equipment such as waders, wading boots, etc., entering the study area that will be used in or around the Upper Truckee River, or new aquatic golf course features will be decontaminated using recommended methods (USACE 2009) before being allowed into the study area.

With the measures described above, weed and aquatic invasive species management practices would be implemented during project construction and the inadvertent introduction and spread of weeds or aquatic invasive species from project construction would be prevented. Therefore, with implementation of Mitigation Measure 3.5-7A (Alt. 2) and 3.5-7B (Alt. 2), Impact 3.5-7 (Alt. 2) would be less than significant.

IMPACT 3.5-8 (Alt. 2) **Short-Term, Construction-Related Disturbance or Loss of Special-Status Wildlife Species and Habitats.** *Under Alternative 2, restoration activities along the Upper Truckee River and reconfiguration of the golf course could result in the loss of individuals or nests, or disruptions to nesting attempts, of six special-status bird species (yellow warbler, olive-sided flycatcher, osprey, long-eared owl, yellow-headed blackbird, and waterfowl species); potential disturbance of future nesting by willow flycatcher; and removal of active roost sites for, or injury to, western red bat. This impact would be* ***potentially significant*** *for species known to be present and for willow flycatcher and western red bat, if the species nests or roosts, respectively, in the study area in the future where construction would occur.*

Six special-status wildlife taxa have been documented in the study area: yellow warbler, yellow-headed blackbird, olive-sided flycatcher, long-eared owl, osprey, and waterfowl species. Eight additional special-status wildlife species were identified as having a moderate or high potential to occur within the study area (Table 3.5-5). Although project implementation is expected to provide long-term benefits for some of these species through restoration of the river corridor and adjacent floodplain (see Impact 3.5-9 [Alt. 2] for a discussion of long-term effects), some short-term adverse impacts are anticipated. These impacts are discussed below for each species. A discussion of those impacts that would be considered significant is provided under “Impact Summary” below.

Yellow Warbler, Willow Flycatcher, Yellow-Headed Blackbird, and Waterfowl

Yellow warbler, willow flycatcher, yellow-headed blackbird, and waterfowl are special-status bird species associated with riparian, wetland, or aquatic habitats (e.g., ponds) that could be affected during construction within and adjacent to the Upper Truckee River channel.

Yellow warbler is designated as a species of special concern by CDFG. Willow scrub in the study area provides summer breeding and foraging habitat for yellow warblers. Individual yellow warblers were detected during the breeding season in 2005 and 2006, during avian surveys conducted by State Parks biologists (Fields, pers. comms., 2005b, 2007a); and this species possibly nests in the study area (surveys to confirm nesting status in the study area have not been conducted). The project is expected to improve habitat along the Upper Truckee River for riparian birds, including yellow warbler, over the long term by increasing riparian vegetation cover, corridor width, and hydrologic connectivity with the stream channel (see Impact 3.5-9 [Alt. 2]). As part of the geomorphic restoration under Alternative 2, fill would be placed in the Upper Truckee River and some adjacent woody riparian and meadow vegetation, which could provide nesting habitat for yellow warbler, would be removed. Under Alternative 2, 5,000 feet of the existing channel would be modified, 2,490 feet of historic channel remnants would be reconnected, and 1,700 feet of new channel would be constructed. Also, a small amount of willow scrub/willow wet meadow (0.20 acre) could be affected by the golf course reconfiguration. Construction within occupied yellow warbler habitat could cause effects on breeding and nesting activities and could affect the size or viability of the local population. Removal of occupied nesting habitat would be a substantial impact if yellow warblers were taken or deterred from occupying breeding and nesting locations. Construction could also result in noise, dust, and other disturbances to nesting birds in the vicinity, resulting in potential nest abandonment and mortality to eggs and chicks.

Willow flycatcher, listed as endangered under CESA, is not known to nest in the study area. This species has not been detected recently during repeated focused surveys, and breeding habitat suitability in the study area is considered marginal because of the degraded hydrologic and vegetation conditions. Although not expected regularly or in substantial numbers, it is possible that willow flycatchers could attempt to nest in riparian habitat before or during project implementation; this assumption is based on a past detection of the species in the study area, recent detections nearby, the study area’s proximity to known populations, and the presence of some potential habitat in the study area. A willow flycatcher was detected in the study area in 1998. In 2007, willow flycatcher was detected along the Upper Truckee River near the airport, approximately 1.4 miles downstream of the study area; and a breeding population occurs along the south Upper Truckee River, approximately 4.5 miles upstream of the study area. If willow flycatchers attempted to nest in the study area along the Upper Truckee

River or elsewhere, project construction could cause the same types of disturbances and loss described for yellow warbler (i.e., removal of occupied nesting habitat, loss of nests or individuals).

Yellow-headed blackbird is designated by CDFG as a species of special concern. Yellow-headed blackbirds have been observed in the study area during the breeding season, at the golf course pond west of the green at hole 4 (Fields, pers. comm., 2010); however, the breeding status of this species within the study area is unknown. The pond where yellow-headed blackbirds have been observed supports some potential breeding habitat. Because this species was observed during the breeding season and potential breeding habitat is present, yellow-headed blackbirds may nest there. Under Alternative 2, habitat occupied by yellow-headed blackbird (the pond west of hole 4) and adjacent areas could be affected by the proposed golf course reconfiguration (e.g., reconfiguration of naturalized landscape surrounding the pond west of hole 4). Construction within or adjacent to occupied yellow-headed blackbird habitat could cause effects on breeding and nesting activities. Removal or disturbance of occupied nesting habitat would be a substantial impact if yellow-headed blackbirds were taken or deterred from occupying breeding and nesting locations. Construction could also result in noise, dust, and other disturbances to nesting birds in the vicinity, resulting in potential nest abandonment and mortality to eggs and chicks.

"Waterfowl" is designated as a special-interest group of species by TRPA. Common waterfowl such as mallard, Canada goose, and common merganser occur in the study area along the Upper Truckee River and golf course ponds. The study area does not include any TRPA-designated waterfowl threshold sites. The quality of nesting habitat for waterfowl is limited along much of the river corridor. The streambed and banks along the Upper Truckee River are incised throughout and severely undercut in some locations. Much of the riparian vegetation grows above the water table, as evidenced by exposed roots along the eroded and incised banks. Also, much of the riparian corridor lacks an herbaceous understory. These conditions do not provide adequate cover for most nesting waterfowl. However, some potential nesting habitat exists within or near the riparian corridor, where vegetation cover is relatively dense. Because surveys for nesting waterfowl have not been conducted within the study area, whether waterfowl species use this area for nesting is presently unknown. Construction-related disturbance (such as noise) associated with these project activities could affect foraging or resting waterfowl. If waterfowl use the area for nesting, construction could result in the loss of active nests, and injury or mortality to individuals.

Olive-Sided Flycatcher

Olive-sided flycatcher is designated by CDFG as a species of special concern. Olive-sided flycatcher has been documented within the study area. Golf course relocation would result in the loss of conifer forest that may provide breeding habitat for this species. If olive-sided flycatcher uses the study area for nesting, construction and vegetation removal associated with geomorphic restoration, golf course relocation, bridge construction, and trail development within occupied habitat could impair breeding and nesting activities. Removal of occupied nesting habitat would be a substantial impact if olive-sided flycatchers were taken or deterred from occupying breeding and nesting locations. Construction within occupied habitat could cause effects on breeding and nesting activities. Project effects could include removal of occupied nesting habitat if individuals were taken or deterred from occupying breeding and nesting locations. Construction could also result in noise, dust, and other disturbances to nesting birds in the vicinity, potentially resulting in nest abandonment and mortality to eggs and chicks.

Osprey and Bald Eagle

Osprey is designated by TRPA as a special-interest species. Bald eagle is listed as endangered under CESA, designated as a sensitive species by USFS, and designated as a special-interest species by TRPA; it also is fully protected under the California Fish and Game Code and protected under the Bald and Golden Eagle Protection Act. Ospreys have been observed in the study area along the Upper Truckee River; they also have been observed foraging in the hole 9 pond on the golf course, which is stocked with rainbow trout. However, this species is not known to nest in the study area. Bald eagles do not nest in or adjacent to the study area; although, they could forage or perch there throughout the year.

If ospreys or bald eagles use the study area or immediate vicinity for foraging, construction related to river restoration, golf course reconfiguration, bridge construction and removal, and trail development could disturb their foraging activities, particularly where these activities would occur near the Upper Truckee River or the hole 9 pond within the golf course. However, because of the presence of existing recreation use and maintenance activities, the existing disturbance level is relatively high; additional construction-related disturbance would not substantially affect the foraging patterns of bald eagle or osprey. Also, abundant and suitable foraging habitat is available in other areas nearby. Construction activities associated with Alternative 2 are not expected to cause injury or mortality to individuals, disrupt breeding attempts, or affect the population size or viability of these species.

Western Red Bat

Western red bat is designated by CDFG as a species of special concern and by USFS Region 5 as sensitive. Western red bat is not known to occur in the study area; however, bat surveys have not been conducted there. Suitable roosting and foraging habitat exist in the study area. Western red bat has been detected at Tallac Marsh, approximately 5 miles away (Borgmann and Morrison 2004). Red bats are found primarily in dense riparian woodland habitats containing willow, cottonwood, and sycamore trees. If roost sites for red bats are present in riparian zones on the study area, project activities that remove or disturb trees (such as any necessary tree removal during geomorphic restoration) could remove or cause abandonment of these features.

Northern Goshawk and Long-Eared Owl

Northern goshawk is designated as a species of special concern by CDFG, is listed as sensitive by USFS Region 5, and considered a special-interest species by TRPA. A small amount of suitable habitat is located in the study area; however, northern goshawks have not been detected during protocol surveys for the species. Goshawks have been observed foraging in the northern portion of Washoe Meadows SP, near Angora Creek (River Run Consulting 2006). (These foraging birds were likely from the Angora Creek territory, which was removed during the 2007 Angora Fire.) Conifer forest in the study area could provide foraging habitat; however, the potential for goshawks to nest in the study area is low because of the lack of substantial area for suitable nesting and high disturbance levels in the surrounding area (e.g., noise from recreation and residential and commercial development).

Effects on breeding goshawks as a result of implementation of Alternative 2 are not expected. If goshawks use the proposed golf course relocation area for foraging, construction could disturb individuals and remove foraging habitat. Because the species typically forages within 1 mile of nest sites, and currently there are no known active nests within 1 mile of the study area and no detections have been recorded within the study area during protocol surveys, this area is not considered an important foraging area for goshawks. Furthermore, larger areas of higher quality habitat nearby (Saxon Creek, Tahoe Mountain, Trout Creek) are available within and adjacent to those territories.

Long-eared owl is designated by CDFG as a species of special concern. In 2006, a long-eared owl was detected in conifer forest on the west side of the study area, by State Parks biologists during owl surveys. The breeding status of long-eared owl in the study area is unknown. Long-eared owls also have been documented elsewhere in the Tahoe Basin (Smith 2002); however, their habitat use has not been well studied. Conifer forest and riparian habitat in the study area provide suitable foraging and nesting habitat for long-eared owl.

If long-eared owls use the study area for nesting, construction and vegetation removal associated with geomorphic restoration, golf course relocation, bridge construction, and trail development within occupied habitat could impair breeding and nesting activities. Removing or disturbing occupied nesting habitat would result in a substantial effect if long-eared owls were taken or deterred from occupying breeding and nesting locations. Construction could also result in noise, dust, and other disturbances to nesting birds in the vicinity, potentially resulting in nest abandonment and mortality to eggs and chicks.

American Marten and Sierra Nevada Snowshoe Hare

American marten is designated as a sensitive species by the USFS Regional Forester and a species of special concern by CDFG; Sierra Nevada snowshoe hare is designated as a species of special concern by CDFG. In 2002, marten surveys were conducted in the study area by State Parks biologists; no martens were detected during the 2002 survey or otherwise documented. The study area supports some suitable marten habitat (River Run Consulting 2006) in conifer forests and forest-meadow edges; however, its potential to function as denning/breeding habitat is limited by high levels of recreation, residential disturbance nearby, and marginal forest structure conditions for the species.

Conifer forest, willow-riparian, and meadow habitats in the study area provide suitable habitat for snowshoe hare, and the species has been documented in the region, including the south Upper Truckee River watershed (USFS unpublished data). In December 2008, snowshoe hare tracks were observed in the west portion of the study area by a State Parks biologist. Because of the high level of human activity in and around the study area (and marginal forest structure for marten), the study area is not expected to provide important breeding or denning habitat for these species. Implementing Alternative 2 is not expected to substantially affect breeding individuals or reproductive success.

If American marten or snowshoe hare use the study area for foraging, noise or other factors associated with construction activities (vegetation removal, clearing, and excavation) could temporarily disturb foraging or movement activities and temporarily displace individuals. Also, individuals could alter their behavior by avoiding the project area during construction. The behavior and local distribution of prey species for marten could be temporarily altered by project activities; this could influence foraging patterns. However, potential disruptions of prey populations would occur locally and are not likely to occur over a substantial portion of any individual's foraging range. Although Alternative 2 could adversely affect individuals and habitat locally, the magnitude and intensity of potential adverse effects are not expected to affect the species' distribution, breeding productivity, local population size, or regional populations of American marten or snowshoe hare.

Mule Deer

Mule deer is designated as a special-interest species by TRPA. Mule deer have been documented foraging and resting in riparian habitat upstream of the study area, above the U.S. 50 crossing in Meyers (River Run Consulting 2006). Mule deer have not been documented in the study area, including during 2008 mammal surveys conducted by Wildlife Resource Consultants. Deer fawning is not expected to occur in the study area. Important habitat requirements for mule deer fawning include undisturbed meadow and riparian areas that provide hiding cover and forage. Riparian and meadow habitat in the study area is likely not suitable for fawning because of disturbance levels from recreation (including golfers, pedestrians, and bicyclists), and residential development (including the regular presence of dogs), and from adjacent land uses. Because the study area provides cover and foraging habitat and the species has been documented nearby, mule deer may occasionally use the study area for foraging and could be disturbed by construction activities. However, the study area is not considered an important or core foraging area for mule deer. Mule deer are relatively rare in the Tahoe Basin near the study area. Deer have not been detected in the study area incidentally during biological surveys (for other species) conducted over the last several years; and the presence of dogs and other disturbance sources reduces the habitat quality for mule deer. Therefore, any potential effects of project implementation on mule deer would not affect the species' distribution, breeding productivity, or local population size.

Impact Summary

Project construction under Alternative 2 could result in the loss of individuals or nests, or disruptions to nesting attempts, of yellow warbler, olive-sided flycatcher, waterfowl, or long-eared owl; potential disturbance of willow flycatcher if the species nests in a construction area in the future; and the removal of an active roost site for, or injury to, western red bat. This impact would be potentially significant for species known to inhabit the study area and for willow flycatcher and western red bat, if they use the site in the future.

Mitigation Measure 3.5-8A (Alt. 2): Conduct Preconstruction Surveys for Nesting Special-Status Birds (Yellow Warbler, Willow Flycatcher, Olive-Sided Flycatcher, Yellow-Headed Blackbird, Waterfowl, and Long-Eared Owl), and Implement a Limited Operating Period If Necessary.

For construction activities that would occur in suitable habitat during the nesting season (generally April 1–August 31, depending on species and weather), a qualified wildlife biologist will conduct focused surveys for active nest sites of special-status birds. The biologist should be able to identify Sierra Nevada bird species audibly and visually. The following provides general guidelines for conducting surveys for yellow warbler, olive-sided flycatcher, willow flycatcher, waterfowl, and long-eared owl.

Yellow Warbler, Olive-Sided Flycatcher, Yellow-Headed Blackbird, Waterfowl, Long-Eared Owl

Focused surveys for yellow warbler, olive-sided flycatcher, yellow-headed blackbird, waterfowl, and long-eared owl nests will be conducted by a qualified wildlife biologist within 14 days before construction activities are initiated each construction season. The preconstruction survey for yellow warbler, olive-sided flycatcher, yellow-headed blackbird, waterfowl, and long-eared owl nests will be conducted using a nest-searching technique appropriate for the species. For example, for yellow warbler, an appropriate technique involves first conducting point counts in suitable riparian habitat to determine occupancy, followed by nest searching if the species is present. For long-eared owl, surveys typically involve tape playbacks of recorded long-eared owl calls.

Willow Flycatcher

For construction activities initiated in suitable breeding habitat for willow flycatcher after May 31, a preconstruction survey for nesting willow flycatchers will be conducted each construction season. The survey will follow *A Willow Flycatcher Survey Protocol for California* (Bombay et al. 2003). The protocol requires a minimum of two survey visits to determine presence or absence of willow flycatcher: one visit during survey period 2 (June 15–25) and one during either survey period 1 (June 1–14) or period 3 (June 26–July 15).

If an active special-status bird nest is located during the preconstruction surveys, the biologist will notify TRPA and CDFG. If necessary, modifications to the project design to avoid removal of occupied habitat while still achieving project objectives will be evaluated, and implemented to the extent feasible. If avoidance is not feasible or conflicts with project objectives, the following limited operating periods will apply to avoid disturbances during the sensitive nesting season. If a yellow warbler, willow flycatcher, yellow-headed blackbird, or waterfowl nest is located, construction will be prohibited within a minimum of 500 feet (or at a distance directed by the appropriate regulatory agency) of the nest to avoid disturbance until the nest is no longer active. If an active long-eared owl nest is located, construction within 0.25 mile of the nest site will be delayed until the site is no longer active. These recommended buffer areas may be reduced through consultation with TRPA or CDFG.

Mitigation Measure 3.5-8B (Alt. 2): Conduct Preconstruction Surveys for Special-Status Bats, Avoid Removal of Important Roosts, and Implement a Limited Operating Period If Necessary.

Bat surveys will be conducted by a qualified wildlife biologist within 14 days before any tree removal or clearing each construction season. Locations of vegetation and tree removal or excavation will be examined for potential bat roosts. Potential roost sites identified will be monitored on two separate occasions for bat activity, using bat detectors to help identify species. Monitoring will begin 30 minutes before sunset and will last up to 2 hours at any potential roost identified. Removal of any significant roost locations discovered will be avoided to the extent feasible. If avoidance is not feasible, roost sites will not be disturbed by project activities until September 1 or later, when juveniles at maternity roosts would be volant (i.e., able to fly).

With the measures above, the project would avoid the loss of individuals, nests, or roost sites of special-status wildlife species during construction. Therefore, with implementation of Mitigation Measures 3.5-8A (Alt. 2) and 3.5-8B (Alt. 2), Impact 3.5-8 (Alt. 2) would be less than significant.

IMPACT 3.5-9 (Alt. 2)	**Long-Term Effects on Special-Status and Common Wildlife Species and Habitats.** *The long-term ecosystem response to river and floodplain restoration under Alternative 2 is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). The effect of river and floodplain restoration on common and special-status wildlife associated with riparian, wetland, and aquatic habitat, and wildlife habitats of special significance would be* ***beneficial****.* *Fully relocating seven golf course holes and partially relocating two holes would remove and fragment upland habitat and increase disturbance levels west of the Upper Truckee River. The new trail at the north end of the reconfigured golf course could facilitate increased access to Washoe Meadows SP to the west and affect common wildlife species. However, the golf course reconfiguration and trail development proposed in Alternative 2 are not expected to substantially affect breeding productivity or population viability of any common or special-status wildlife, or cause a change in species diversity locally or regionally. Therefore, the impact of golf course reconfiguration and trail development on common and special-status wildlife would be* ***less than significant****.*

River and Floodplain Restoration

As discussed previously, under Alternative 2, incompatible land uses associated with the golf course would be removed from most areas adjacent to the Upper Truckee River channel and adjoining riparian vegetation communities would be restored. Approximately 97 acres of floodplain and meadow would be restored. Golf course holes would be relocated to an area on the west side of the river, farther from the river, that contains less sensitive land; relocating the holes would reduce the acreage of SEZ occupied by the golf course. A total of 37 acres of SEZ would be restored.

Implementing Alternative 2 would involve several activities, including restoration of the physical channel form combined with restored hydraulic conditions and geomorphic processes. Many benefits of the restoration project would be realized over time as functional geomorphic processes shape channel morphology and associated habitat features that provide important functions and values for riparian and aquatic wildlife communities. Increased riparian vigor would provide important cover for riparian and aquatic wildlife such as amphibians. Riparian vegetation cover and patch size within the SEZ would also increase and become more contiguous as riparian vegetation matures. Riparian vegetation would colonize streambanks and instream bars, resulting in variability in resistance to erosion and promoting deposition in localized areas, which in turn would increase channel complexity. These processes, which rely on regular disturbance resulting from flood events, would improve riparian and aquatic habitat functions and values over a period of several decades, and would maintain these habitats over time.

Under Alternative 2, the active floodplain would be restored and enlarged, providing increased hydrologic connectivity and frequency of river overbanking through channel restoration. The active (5-year) floodplain area would increase from 36 acres under the existing condition to 77 acres under Alternative 2. Implementing Alternative 2 would increase the frequency of river overbanking, which would improve the development, persistence and regeneration, and quality of wetland and riparian vegetation (and wildlife habitat) within the floodplain.

In the long term, ecosystem response to restoration under Alternative 2 is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. Expected long-term results of ecosystem restoration along the river that would improve habitat are increased riparian vegetation cover and continuity, corridor width, and patch size; development of a riparian understory; and increased soil moisture and saturation within the floodplain, as a result of improved hydrologic connectivity of the floodplain to the stream channel. For example, in the Sierra Nevada, surface wetness and soil saturation are primary factors limiting the distribution and persistence of wet meadow systems that can function as songbird population sources. Increases in soil saturation and standing or slow-moving water in floodplain meadows can improve foraging conditions and breeding productivity of several riparian species, and enhance habitat for amphibians and other species that require wet conditions.

Golf Course Reconfiguration and Trail Development

Implementing Alternative 2 involves reconfiguring the Lake Tahoe Golf Course by fully relocating seven golf course holes and partially relocating two holes to the west side of the Upper Truckee River. Approximately 60 acres of lodgepole pine forest, Jeffrey pine forest, dry meadow, sagebrush dry meadow, and other vegetation types would be removed as a result of the golf course relocation. Also, a new designated trail system would be constructed to extend the informal dispersed recreation trails on the west side of the river across the new bridge, where they would tie in to new trails on the east side of the river. The trail system would include a new trail around the north end of the western section of the golf course that would allow access across a new bridge.

Several common resident and migratory wildlife species (described in Section 3.5.1, “Affected Environment”) use habitats in the proposed golf course relocation area for foraging, shelter, and breeding. Regionally and locally common wildlife species would be subject to the loss of habitat and increased localized habitat fragmentation. Habitat loss and fragmentation could result in the reduction of population sizes and diminished use of the study area by some local wildlife populations. However, other local wildlife populations that are not sensitive to human disturbance or landscape conversion to golf course turf, or that benefit from increased habitat edges created by fragmentation would not be affected.

Regionally and locally common wildlife species would also be disturbed by operation of the golf course through increased and regular human intrusion in the area between the Upper Truckee River and the neighborhoods to the south and west. Increased recreational use of this area would further reduce the habitat value for wildlife. Most of the new trail at the north end of the new golf course holes would be located within the golf course’s matrix of minimally managed landscape, naturalized landscape, turf, and greens and tees. Therefore, the new trail is not expected to substantially increase use at this location above levels that would already result from access and use of the relocated golf course. However, the new trail’s connection to existing trails and designation as part of a trail system could facilitate increased access of Washoe Meadows SP to the west, which would affect common wildlife species.

These common species are relatively abundant locally and regionally, and not limited by the availability of habitat in the region. Also, upland habitat in the proposed golf course relocation area is presently degraded and experiences relatively high levels of disturbance from use of volunteer trails by bicyclists and pedestrians (and dogs), and edge effects from adjacent residential development. This area of upland habitat is not considered critical or limiting to the presence or viability of common wildlife populations in the region. Relocating the golf course holes as proposed under Alternative 2 would not cause wildlife populations to decrease below self-sustaining levels, or result in a change in species diversity.

Special-status wildlife species known or with potential to use upland habitats in the study area for foraging or breeding (long-eared owl, olive-sided flycatcher, northern goshawk, American marten, Sierra Nevada snowshoe hare, mule deer) could be affected in the same ways as common wildlife (i.e., by habitat loss and fragmentation, increased recreation disturbance). However, for the reasons discussed in Impact 3.5-8 (Alt. 2) (marginal forest structure, high levels of disturbance, or lack of occurrence records), upland habitat in the golf course relocation area is not expected to provide important or core breeding habitat for these species, or foraging areas critical to population viability and local or regional distribution. Furthermore, larger areas of higher quality and less disturbed habitat for these species are available nearby (e.g., south Upper Truckee River watershed, Saxon Creek watershed, Trout Creek watershed). Therefore, implementing Alternative 2 is not expected to substantially affect breeding productivity, local population size, or regional populations of any special-status wildlife species.

Impact Summary

The long-term ecosystem response to river and floodplain restoration under Alternative 2 is expected to substantially improve the quality and functions of habitat for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. River and floodplain restoration would also increase the size and enhance the functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). The effect on common and special-status wildlife associated with riparian, wetland, and aquatic habitat, and wildlife habitats of special significance would be beneficial.

Under Alternative 2, fully relocating seven golf course holes and partially relocating two holes would remove and fragment upland habitat and increase disturbance levels west of the Upper Truckee River. The new trail at the north end of the new golf course could facilitate increased access to Washoe Meadows SP to the west, which would affect common wildlife species. However, the golf course relocation and trail development proposed in Alternative 2 are not expected to substantially affect breeding productivity or population viability of any common or special-status wildlife, or to cause a change in species diversity locally or regionally. Therefore, the impact of golf course relocation and trail development on common and special-status wildlife would be less than significant.

No mitigation is required.

IMPACT 3.5-10 (Alt. 2)	Effects on Potential Wildlife Movement Corridors. *Under Alternative 2, the increased area and improved ecosystem functions of SEZ, floodplain, and riparian and wetland communities along the Upper Truckee River would benefit wildlife communities. These benefits would improve the localized SEZ's wildlife corridor function by increasing habitat quality, native vegetation connectivity, and corridor width. This effect would be* ***beneficial****.* *Golf course relocation would remove approximately 60 acres and fragment upland habitat west of the Upper Truckee River. This area is not expected to function as a significant movement corridor for common or sensitive wildlife species. Therefore, the impact of golf course relocation on wildlife movement corridors would be* ***less than significant****.*

The California Essential Habitat Connectivity Project has a recently-completed, peer-reviewed statewide assessment of important habitat linkages (Spencer et al. 2010). The project's goal was to identify large remaining blocks of intact habitat or natural landscape at a coarse spatial scale, and model linkages between them that are important to maintain as corridors for wildlife. The study area is not within any area identified as a high priority for maintaining regional wildlife corridors. While no wildlife movement corridors have been confirmed to occupy the study area, its large size and location between the river and nearby forest areas make it potentially suitable for localized wildlife movement. The study area is bordered on the east and south by U.S. 50, on the west by residential neighborhoods, and on the north by Sawmill Road. On a watershed scale, the roadways and residences may limit the study area's potential value to facilitate long-ranging wildlife movement, particularly that of medium-sized and large animals. Washoe Meadows SP and the west side of the study area compose a large block of open space, positioned between Angora Ridge and the south Upper Truckee River watershed. The mix of forest, meadow, and riparian habitat in this block of open space, within the context of the larger complex of open space or low-density development to the north and south of the study area, provides a potential habitat link within the Upper Truckee River watershed and the Tahoe Basin.

Of all locations and habitats within the study area, the Upper Truckee River's riparian corridor is considered the most likely to function as a potentially important wildlife movement corridor. Depending on their setting, quality, and physical connectivity to other habitats, stream corridors are thought to often be used by wildlife as movement corridors in many landscapes; the Upper Truckee River may serve this function. The Upper Truckee River's riparian corridor is a well-defined linear landscape feature that provides unique biophysical conditions, traverses a variety of ecotones and connects upstream and downstream areas within the watershed; however, it is degraded in its current condition within the study area by the presence of the golf course near or abutting the river. The presence of golf course adjacent to the river has also disrupted riparian habitat continuity in some locations. As discussed previously, the increased area and improved ecosystem functions of SEZ, floodplain, and wetland communities along the Upper Truckee River under Alternative 2 would benefit wildlife communities locally; these benefits would improve the SEZ's corridor function by increasing habitat quality, connectivity of native vegetation, and corridor width.

Golf course relocation under Alternative 2 would remove approximately 60 acres and fragment upland habitat west of the Upper Truckee River. This area is not expected to function as a significant corridor for common or sensitive wildlife species. Existing potential for upland habitat at this location to function as a wildlife movement corridor is compromised by its proximity to residential neighborhoods to the west (North Upper Truckee Road and adjoining neighborhoods), north (Echo View Estates, Tahoe Mountain), and south (San Bernardino Road and South Upper Truckee neighborhoods), and well-traveled roads (U.S. 50 to the south and east, Sawmill Road to the north). Reconfiguring the golf course is not expected to bifurcate any important habitat areas or prevent wildlife from continuing to access or travel between habitat areas in the vicinity.

None of the special-status species that could be affected by golf course reconfiguration and that require ground-based movements or dispersal (e.g., mammals such as American marten, mule deer, Sierra Nevada snowshoe hare) are expected to use upland communities in the study area for critical foraging or breeding habitat (see Impacts 3.5-8 [Alt. 2] and 3.5-9 [Alt. 2]), and the golf course relocation area likely does not function as a movement corridor required to maintain population viability. This area is disturbed by recreation and residential and commercial development, and provides relatively low-suitability habitat for these species. Populations of common species that range medium to long distances and that likely use conifer forest west of the Upper Truckee River, such as black bear and coyote, could still cross through the area from dusk to dawn o access nearby lands without encountering golfers. In the Tahoe Basin, these common species are relatively abundant, generally adapted to human disturbance, and can move through a variety of urban and nonurban landscapes. Also, these species would be able to use higher-quality habitat along the restored river and floodplain.

Impact Summary

The increased area and improved ecosystem functions of SEZ, floodplain, and riparian and wetland communities along the Upper Truckee River under Alternative 2 would benefit wildlife communities; these benefits would improve the SEZ's wildlife corridor function by increasing habitat quality, connectivity of native vegetation, and corridor width. This effect would be beneficial.

Golf course reconfiguration under Alternative 2 would remove approximately 60 acres and fragment upland habitat west of the Upper Truckee River. However, this area is not expected to function as a significant corridor for common or sensitive wildlife species. Therefore, the impact of golf course reconfiguration on wildlife movement corridors would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.5-1 (Alt. 3)	Short-Term Degradation of Fish and Aquatic Habitat Resulting from Construction and Initial Channel Response. *Alternative 3 construction activities could result in temporary adverse effects on water quality, aquatic habitats, and the aquatic community. Effects could also occur during the initial channel-response period within the study area and in areas downstream. This impact would be* ***significant****.*

Alternative 3 involves restoring a 13,430-foot-long reach of the Upper Truckee River and adjoining floodplain, and reconstructing a reduced-play golf course on the east side of the river, which would be designed to minimize the footprint of the golf course within the SEZ.

Water Quality: Sedimentation and Turbidity, Release and Exposure of Contaminants

As under Alternative 2, construction activities under Alternative 3 would disturb instream sediments and soils adjacent to waterways. However, the active channel would not be disturbed during year 1 of construction. Any resulting erosion or disturbance of instream sediments and soils would temporarily increase turbidity and sedimentation downstream of the construction sites throughout the study area if soils were transported in the river flows or stormwater runoff. The potential also exists for contaminants used in construction activities to be accidentally introduced into the water system, either directly through spills or incrementally through surface runoff, from work within or immediately adjacent to the channel. Several measures would be implemented as part of Alternative 3 to minimize potential water quality effects. (See Chapter 2, “Project Alternatives,” and Section 3.4, “Water Quality and Geomorphology,” for additional discussion of this issue.) Potential effects on fish and aquatic habitat would be similar to those described for Alternative 2.

Direct Disturbance and Temporary Loss of Habitat during Construction Activities

Several aspects of project construction under Alternative 3 would require dewatering of the active channel to allow access to and removal of riparian vegetation that provides important shade and cover. These activities and the associated effects on fish and aquatic habitats would be similar to those described for Alternative 2. Dewatering would occur only in year 3 and possibly in year 4. Some water would be diverted during year 2 for channel seasoning of off-channel sections completed in year 1.

Initial Channel Response

After the completion of construction activities, some habitat improvements associated with river ecosystem restoration activities would be realized immediately. However, the new physical form of the channel and associated floodplain would also result in immediate changes to hydraulic conditions, which in turn would result in a geomorphic response for some period of time until a new dynamic equilibrium was reached. Depending on the specific, localized circumstances, this could include localized changes in water velocities and sediment transport and depositional patterns. Because the geomorphic response is process driven and subject to several highly variable conditions (e.g., frequency, duration, and magnitude of intermediate- to high-flow events; local sediment grain sizes; local channel geometry), it can be extremely difficult to predict the nature and extent of short-term (interim) outcomes. Nevertheless, as described for Alternative 2, it is possible that some aquatic habitat conditions could become degraded during the channel’s initial response to the changed physical condition.

Impact Summary

As under Alternative 2, project construction activities under Alternative 3 could result in intermittently increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants. These would be potential short-term, temporary effects. Such exposure could reduce or adversely affect fish habitat and fish populations, including salmonids and other native fish species. Alternative 3 includes a suite of measures, including BMPs, that would minimize this potential effect. Construction would include dewatering activities that would result in the temporary loss of aquatic habitat. Fish and macroinvertebrates could become stranded during dewatering activities, and habitat could dry out or predation by birds or mammals could occur; or the organisms would be injured or killed by heavy equipment during site access, preparation, or construction activities. Lastly, implementing Alternative 3 could result in short-term adverse effects on aquatic habitats because the river channel’s geomorphic response would affect sediment transport and deposition processes during the initial channel-response period. This impact would be significant.

Mitigation Measure 3.5-1A (Alt. 3): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.5-1A (Alt. 2).

Mitigation Measure 3.5-1B (Alt. 3): Implement Preconstruction Surveys for Western Pearlshell Mussels.

This mitigation measure is identical to Mitigation Measure 3.5-1B (Alt. 2).

Mitigation Measure 3.5-1C (Alt. 3): Develop and Implement Native-Fish and Mussel Capture and Translocation Plan.

This mitigation measure is identical to Mitigation Measure 3.5-1C (Alt. 2).

Mitigation Measure 3.5-1D (Alt. 3): Limit Potential Localized Channel Erosion in the Upper Truckee River and Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.5-1D (Alt. 2).

Mitigation Measure 3.5-1E (Alt. 3): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.5-1E (Alt. 2).

Mitigation Measure 3.5-1F (Alt. 3): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

This mitigation measure is identical to Mitigation Measure 3.5-1F (Alt. 2).

Mitigation Measure 3.5-1G (Alt. 3): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.5-1G (Alt. 2).

Mitigation Measure 3.5-1H (Alt. 3): Monitor and Supplement Coarse-Sediment Delivery Downstream and Monitor Instream Habitat Conditions.

This mitigation measure is identical to Mitigation Measure 3.5-1H (Alt. 2).

With the measures described above, potential short-term adverse effects on aquatic habitat would be avoided and/or minimized, or corrective actions would be implemented. Therefore, with implementation of Mitigation Measures 3.5-1A (Alt. 3) through 3.5-1H (Alt. 3), Impact 3.5-1 (Alt. 3) would be less than significant.

IMPACT 3.5-2 (Alt. 3)	**Long-Term Changes to Fish and Aquatic Habitat.** *River restoration activities under Alternative 3 would result in long-term beneficial effects on aquatic habitats and the fish community in the Upper Truckee River. These beneficial effects would result from several changes: the removal of golf course infrastructure adjacent to and within the river; improved conditions for riffle and pool complexes and substrate through restored geomorphic processes; improved floodplain connectivity and access to secondary channels; increased habitat structure and complexity; and reduced sediment inputs into the river associated with existing, ongoing bank erosion. This effect would be* ***beneficial****.*

River restoration activities under Alternative 3 would substantially increase the length of the channel and width of the riparian corridor and would restore natural processes within the project area, resulting in greater availability of habitat for the fish and macroinvertebrate community. Increased sinuosity would improve pool development and maintenance, and a wider and more rigorous riparian vegetation community would lead to increased riparian cover and instream complexity through the introduction of woody debris. As under Alternative 2, many of the benefits of river restoration under Alternative 3 would be realized over time, as functional geomorphic processes shape channel morphology and associated habitat features that provide important functions and values to the fish and macroinvertebrate community. These processes, which rely on regular disturbance resulting from flood events, would result in improvements in aquatic habitat functions and values over a period of several decades, and would assure that aquatic habitat is maintained over time. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-3 (Alt. 3)	Short-Term, Construction-Related Disturbance or Loss of Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ). *Implementing Alternative 3 would result in the removal of riparian and meadow vegetation along the Upper Truckee River, and placement of fill into the active channel for geomorphic restoration of the river. This impact would be* ***significant****.*

Treatment for the Upper Truckee River under Alternative 3 would be the same as the river treatment under Alternative 2 except that Alternative 3 would not include any bridges over the river. Alternatives 2 and 3 would treat the lower portion of Angora Creek, the mouth of the unnamed creek, and restoration of adjoining floodplain and meadow similarly. Effects on sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ) would be similar to those described in Impact 3.5-3 (Alt. 2) because these sensitive habitats occur primarily along the Upper Truckee River, Angora Creek, and the unnamed drainage in the golf course. Please refer to Impact 3.5-3 (Alt. 2) for a detailed description of the potential impact. Because the golf course would not be relocated west of the river and the quarry wetlands would not be restored under Alternative 3, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected. Under this alternative, sensitive habitat types, including SEZ, would be temporarily disturbed and fill material would be placed into jurisdictional waters of the United States, including wetlands subject to USACE jurisdiction under CWA Section 404. Therefore, this impact would be significant.

Mitigation Measure 3.5-3A (Alt. 3): Conduct Delineation of Waters of the United States and Obtain Authorization of Fill and Required Permits.

This mitigation measure is identical to Mitigation Measure 3.5-3A (Alt. 2).

Mitigation Measure 3.5-3B (Alt. 3): Implement Vegetation Protection Measures and Revegetate Disturbed Areas.

This mitigation measure is identical to Mitigation Measure 3.5-3B (Alt. 2).

With the measures described above, sensitive habitats would be identified, and the project would compensate for their loss and define measures for increasing riparian and wetland vegetation. Therefore, with implementation of Mitigation Measures 3.5-3A (Alt. 3) and 3.5-3B (Alt. 3), Impact 3.5-3 (Alt. 3) would be less than significant.

IMPACT 3.5-4 (Alt. 3)	Short-Term, Construction-Related Disturbance or Removal of Special-Status Plants*. Alternative 3 would involve temporary disturbance and removal of plant communities that provide suitable habitat for several special-status plant species known to occur in the vicinity of the study area. While surveys to date have not detected these species, focused surveys to confirm absence would not be conducted until the project permitting phase. Because suitable habitat exists where ground disturbance could occur, implementing Alternative 3 could result in removal or disturbance of special-status plant species. This impact would be* ***potentially significant****.*

This impact would be similar to Impact 3.5-4 (Alt. 2). Treatment for the Upper Truckee River in Alternative 3 would be the same as the river treatment under Alternative 2. Alternatives 2 and 3 would treat the lower portion of Angora Creek, the mouth of the unnamed creek, and restoration of adjoining floodplain and meadow similarly. However, Alternative 3 would not include any bridges over the Upper Truckee River or Angora Creek; nor does it propose golf course reconfiguration on the west side of the Upper Truckee River. Instead this alternative proposes to reduce the area disturbed by golf course and keep it within the existing footprint. River treatments under

Alternative 3 would involve ground-disturbing activities in areas where special-status plant species have potential to occur. (Please refer to Impact 3.5-4 [Alt. 2] for a detailed description of potential effects.) Therefore, this impact would be potentially significant.

Mitigation Measure 3.5-4 (Alt. 3): Conduct Follow-up, Pre-Construction, Focused Surveys and Avoid, Minimize, or Compensate for Impacts on Special-Status Plants.

This mitigation measure is identical to Mitigation Measure 3.5-4 (Alt. 2).

With the measure described above, the project would avoid the loss of special-status plant species. Therefore, with implementation of Mitigation Measure 3.5-4 (Alt. 3), Impact 3.5-4 (Alt. 3) would be less than significant.

IMPACT 3.5-5 (Alt. 3)	**Long-Term Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens and SEZ) and Special-Status Plant Species.** *The long-term goal of the project under Alternative 3 is to minimize the footprint of the golf course within the SEZ, and increase floodplain meadow vegetation as well as wetland area and functions. Implementing Alternative 3 would restore approximately 112 acres of floodplain meadow vegetation and 43 acres of SEZ. This effect would be* ***beneficial****.*

Under Alternative 3, incompatible land uses associated with the golf course would be removed from areas adjacent to the Upper Truckee River and Angora Creek, and adjoining riparian vegetation communities would be restored. All five existing bridges over the Upper Truckee River and four cart path/pedestrian bridges over Angora Creek would be removed. Approximately 112 acres of floodplain and meadow would be restored. The golf course's footprint would be reduced to 86 acres, reducing the amount of SEZ occupied by the golf course by 43 acres. A net total of 43 acres of SEZ would be restored. In addition, as part of floodplain restoration, the 0.75-acre storm drainage pond by existing holes 14 and 15 would be reconfigured, designed as a wetland or oxbow feature, and revegetated. The approach to restoration is designed to reverse the negative trends of erosion caused by past channelization, existing infrastructure, and associated land uses. The increased area and improved ecosystem functions of SEZ, floodplain, and wetland communities would be beneficial because they would result in a long-term net increase in the acreage of sensitive habitats. No construction disturbance related to golf course reconfiguration, quarry restoration, or trail development would occur on the west side of the Upper Truckee River under this alternative; therefore, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected.

In addition, areas of restored SEZ and floodplain would increase the area of suitable habitat for special-status plant species that have potential to occur within the area. Marsh skullcap, Oregon fireweed, and Bolander's candle moss, discussed under Impact 3.5-4 (Alt. 2), have potential to occur in moist riparian habitats and would benefit from the long term increase in this habitat type. A nearby population of marsh skullcap in Washoe Meadows SP responded favorably to a restoration project along Angora Creek and grows vigorously along the newly created banks of that creek. The increased size of SEZ, floodplain meadow vegetation, and wetland communities could provide additional habitat for these species. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-6 (Alt. 3) **Tree Removal and Forest Land Conversion.** *Implementing Alternative 3 would result in the loss of an estimated 253 native trees greater than 10 inches DBH, including 120 trees for geomorphic restoration, 125 trees for access road construction, and eight trees for golf course redesign east of the Upper Truckee River. None of the tree removal would involve conversion of forest to non-forest uses and no old growth forest systems would be affected. This preliminary estimate of trees removed includes two trees greater than 30 inches DBH. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The magnitude of proposed tree removal in the study area is considered "substantial" as defined in the TRPA Code of Ordinances. Implementing Alternative 3 would require a tree removal and management plan developed with TRPA. Substantial tree removal and the loss of trees greater than 30 inches DBH would be a* ***significant*** *impact.*

Implementing Alternative 3 would involve the same geomorphic restoration treatments as Alternative 2. As a result, under Alternative 3, tree removal in the riparian zone of the Upper Truckee River would be similar to that described under Impact 3.5-6 (Alt. 2) for Alternative 2. Because Alternative 3 does not involve creating new golf course holes or removing trees from upland forest habitat on the west side of the river, forest land conversion to golf course would not occur and substantially fewer trees would be removed under this alternative. Implementing Alternative 3 would result in the removal of approximately 253 native trees greater than 10 inches DBH, including 120 trees for geomorphic restoration, 125 trees for access road construction, and eight trees for golf course redesign on the east side of the river. This estimate includes two trees greater than 30 inches DBH that would be removed for geomorphic restoration. However, trees to be removed under Alternative 2 will not affect an old growth forest. Tree removal estimates were calculated by State Parks, as discussed in Impact 3.5-6 (Alt. 2) for Alternative 2. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction.

The tree removal estimates for Alternative 3 include trees that may be removed in the future for additional vegetation management and fuels treatments prior to, or in the absence of, project implementation. For example, some lodgepole pines that would be removed within the riparian corridor as part of the geomorphic restoration under Alternative 3 would be removed as part of State Parks' existing management to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project), and as part of the Lake Sector Wildfire Management Plan. Removal of conifers from SEZs for riparian hardwood enhancement is a specific land management objective of State Parks, and some of the tree removal implemented under Alternative 3 would have a long-term beneficial ecological effect. Also, as a result of geomorphic, floodplain, and SEZ restoration, a net increase in riparian tree abundance, cover, and productivity is expected following project implementation.

Provisions for tree removal are provided in the TRPA Code of Ordinances (Chapter 71, and Chapters 30, 65, 75, and 77), and tree removal requires the review and approval of TRPA. TRPA defines "substantial" tree removal as "activities on project areas of twenty acres or more and proposing the removal of more than 100 live trees 10 inches DBH or larger, or proposing the removal of more than 100 live trees 10 inches DBH or larger within land capability districts 1a, 1b, 1c, 2, or 3 regardless of the project area, or proposing tree removal that, as determined by TRPA after a joint inspection with appropriate State or Federal forestry staff, does not meet the minimum acceptable stocking standards set forth in Subsection 71.4.B" (TRPA Code of Ordinances, Section 71.4.I). Additionally, trees greater than 30 inches DBH must be retained, except under circumstances specified in the Code of Ordinances.

Although geomorphic restoration and golf course reconfiguration requiring tree removal in Alternative 3 would be ecologically beneficial over the long term, the magnitude of estimated tree removal (253 native trees greater than 10 inches DBH) would be substantial as defined by TRPA; and approximately two trees greater than 30 inches DBH would be removed. This impact would be significant.

Mitigation Measure 3.5-6 (Alt. 3): Minimize Tree Removal and Develop a Tree Removal and Management Plan.

This mitigation measure is identical to Mitigation Measure 3.5-6 (Alt. 2).

With the measure described above, the project would minimize tree removal and compensate, as needed, for the significant loss of trees. Therefore, with implementation of Mitigation Measure 3.5-6 (Alt. 3), Impact 3.5-6 (Alt. 3) would be less than significant.

IMPACT 3.5-7 (Alt. 3)	**Introduction and Spread of Weeds and Aquatic Invasive Species.** *Implementing Alternative 3 has the potential to introduce and spread invasive weeds and aquatic invasive species during the initial phases of project construction and implementation. The introduction and spread of invasive weeds or aquatic invasive species would degrade plant and wildlife habitat, including habitats of special significance (riparian) within the study area. During the construction related to the transition from an 18-hole golf course to a reduced-play golf course, the course could serve as an additional source point or harbor for the introduction and/or establishment of weeds. However, implementation of the golf course's existing weed management plan would continue on the reduced-play golf course and would sufficiently prevent the spread of nonnative plants within areas of native vegetation during operation of the golf course. Introduction and spread of invasive weeds and aquatic invasive species during construction and revegetation would be a* ***potentially significant*** *impact.*

Alternative 3 would involve the same geomorphic restoration treatments as Alternative 2 and the construction of a reduced-play golf course in place of the current 18-hole golf course. Treatment for the Upper Truckee River under Alternative 3 would be the same as under Alternative 2 except that Alternative 3 would not include any bridges over the river. Alternatives 2 and 3 would treat the lower portion of Angora Creek, the mouth of the unnamed creek, and restoration of adjoining floodplain and meadow similarly. The total area of ground disturbance would be much less under Alternative 3 because golf course holes would not be relocated west of the river under this alternative. However, substantial ground-disturbing activities and construction activities within the Upper Truckee River would still occur, and effects from the introduction and spread of weeds and aquatic invasive species would be similar to those described in Impact 3.5-7 (Alt. 2) for Alternative 2. Please refer to Impact 3.5-7 (Alt. 2) for a detailed description of potential effects. This short-term, construction-related impact would be potentially significant.

During the transition from an 18-hole golf course to a 9-hole golf course, the course could serve as an additional source point or harbor for the introduction and/or establishment of weeds. This effect would be similar to but of less magnitude than the effect under Alternative 2. Once the reduced-play golf course is established, the weed management plan implemented by the existing golf course (see Chapter 2, "Project Alternatives") is expected to sufficiently prevent the long-term spread of nonnative plants from the golf course into adjacent areas of native vegetation.

Mitigation Measure 3.5-7A (Alt. 3): Implement Weed Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7A (Alt. 2).

Mitigation Measure 3.5-7B (Alt. 3): Implement Aquatic Invasive Species Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7B (Alt. 2).With the measures described above, weed and aquatic invasive species management practices would be implemented during project construction and the inadvertent introduction and spread of weeds or aquatic invasive species from project construction would be prevented. Therefore, with implementation of Mitigation Measure 3.5-7A (Alt. 3) and 3.5-7B (Alt.3), Impact 3.5-7 (Alt. 3) would be less than significant.

IMPACT 3.5-8 (Alt. 3) **Short-Term, Construction-Related Disturbance or Loss of Special-Status Wildlife Species and Habitats.** *Under Alternative 3, restoration activities along the Upper Truckee River and golf course reconfiguration could result in the loss of individuals or nests, or disruptions to nesting attempts of six special-status bird species (yellow warbler, olive-sided flycatcher, osprey, long-eared owl, yellow-headed blackbird, and waterfowl species); potential disturbance of future nesting by willow flycatcher; and removal of active roost sites for, or injury to, western red bat. This impact would be* ***potentiallysignificant*** *for species known to be present and for willow flycatcher and western red bat if the species nests or roosts, respectively, in the study area in the future where construction would occur.*

Alternative 3 would involve the same geomorphic restoration treatments as Alternative 2. Construction activities could result in the disturbance or loss of nests for yellow warbler, olive-sided flycatcher, willow flycatcher, waterfowl, or long-eared owl and the removal of roost sites for western red bat. All of these special-status species could use the Upper Truckee River corridor for breeding habitat. Habitat occupied by yellow-headed blackbird (the pond west of hole 4) and adjacent areas could be affected by the proposed golf course reconfiguration (e.g., reconfiguration of naturalized landscape surrounding the pond west of hole 4). These impacts would be the same as those described for the river and floodplain restoration and golf course reconfiguration components of Impact 3.5-8 (Alt. 2). Please refer to Impact 3.5-8 (Alt. 2) for a detailed description of potential effects. Under Alternative 3, no construction disturbance related to golf course relocation or trail development on the west side of the Upper Truckee River would occur; therefore, the amount of potential habitat for long-eared owl and olive-sided flycatcher (which could nest in upland habitats west of the river) affected would be lower under Alternative 3 than under Alternative 2.

Project construction under Alternative 3 could result in the loss of individuals or nests, or disruptions to nesting attempts, of yellow warbler, waterfowl, olive-sided flycatcher, yellow-headed blackbird, or long-eared owl; potential disturbance of willow flycatcher if the species nests in a construction area in the future; and the removal of an active roost site for, or injury to, western red bat. This impact would be potentially significant for species known to inhabit the study area and for willow flycatcher and western red bat, if they use the habitat in the future.

Mitigation Measure 3.5-8A (Alt. 3): Conduct Preconstruction Surveys for Nesting Special-Status Birds (Yellow Warbler, Olive-Sided Flycatcher, Willow Flycatcher, Yellow-Headed Blackbird, Waterfowl, and Long-Eared Owl), and Implement a Limited Operating Period If Necessary.

This mitigation measure is identical to Mitigation Measure 3.5-8A (Alt. 2).

Mitigation Measure 3.5-8B (Alt. 3): Conduct Preconstruction Surveys for Special-Status Bats, Avoid Removal of Important Roosts, and Implement a Limited Operating Period If Necessary.

This mitigation measure is identical to Mitigation Measure 3.5-8B (Alt. 2).

With the measures above, the project would avoid the loss of individuals, nests, or roost sites of special-status wildlife species during construction. Therefore, with implementation of Mitigation Measures 3.5-8A (Alt. 3) and 3.5-8B (Alt. 3), Impact 3.5-8 (Alt. 3) would be less than significant.

IMPACT 3.5-9 (Alt. 3) **Long-Term Effects on Special-Status and Common Wildlife Species and Habitats.** *The long-term ecosystem response to river and floodplain restoration under Alternative 3 is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). This effect would be* ***beneficial****.*

Alternative 3 would involve the same geomorphic restoration treatments as Alternative 2. The long-term ecosystem response to river and floodplain restoration under Alternative 3 is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). Please refer to Impact 3.5-9 (Alt. 2) for a detailed description of potential effects.

Additionally, under Alternative 3, the existing golf course footprint would be reduced from the present 133 acres to 86 acres; it would also be 70 acres smaller than under Alternative 2 (156 acres). Relative to Alternative 2, Alternative 3 would result in the restoration of 6 more acres of SEZ, 7 more acres of 100-year floodplain, and 15 more acres of floodplain/meadow.

For the reasons described above, this effect would be beneficial.

No mitigation is required.

IMPACT 3.5-10 (Alt. 3)	Effects on Potential Wildlife Movement Corridors. *Under Alternative 3, the increased area and improved ecosystem functions of SEZ, floodplain, and riparian and wetland communities along the Upper Truckee River would benefit wildlife communities. These benefits would improve the SEZ's localized wildlife corridor function by increasing habitat quality, native vegetation connectivity, and corridor width. This effect would be* ***beneficial.***

Please refer to Impact 3.5-10 (Alt. 2) for a discussion of the potential for the Upper Truckee River corridor to function as a wildlife movement corridor, and the ways in which habitat enhancement there could improve this potential function. Alternative 3 would involve the same geomorphic restoration treatments as Alternative 2, and would improve the potential function of the Upper Truckee River SEZ and floodplain as a localized wildlife corridor by increasing habitat quality, native vegetation connectivity, and corridor width. This impact would be similar to that described for the river and floodplain restoration component of Impact 3.5-10 (Alt. 2) under Alternative 2. Please refer to Impact 3.5-10 (Alt. 2) for a detailed description of the potential impact. However, relative to Alternative 2, Alternative 3 would result in restoration of 6 more acres of restored SEZ, 7 more acres of 100-year floodplain, and 15 more acres of floodplain/meadow.

Additionally, under Alternative 3, no habitat loss or potential wildlife corridor disturbance related to golf course relocation or trail development on the west side of the Upper Truckee River would occur. Therefore, any potential degradation or disturbance of the Upper Truckee River corridor as a result of new golf course development west of the river (i.e., edge effects of golf course development) would not occur under Alternative 3, and the overall value of the river corridor for wildlife movement would be higher than under Alternative 2.

For the reasons described above, this effect would be beneficial.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.5-1 (Alt. 4)	Short-Term Effects on Fish and Aquatic Habitat Resulting from Construction and Initial Channel Response. *Alternative 4 construction activities could result in temporary adverse effects on water quality, aquatic habitats, and the aquatic community. Because Alternative 4 would stabilize the river, initial channel-response effects within the study area and in areas downstream would be minimal. This impact would be* ***significant.***

Alternative 4 would use a combination of hard and soft stabilization to keep the river in its present configuration and would make only minor changes to the existing golf course. It would involve the systematic and extensive installation of bank protection and grade controls (boulder steps) within the present river alignment and at the existing elevations. Although the streambed and streambank protections would be relatively rigid, biotechnical treatments with native riparian vegetation would be incorporated to the maximum extent possible. Three of the existing bridges would remain in place while the two upstream bridges would be replaced by one longer bridge.

Water Quality: Sedimentation and Turbidity, Release and Exposure of Contaminants

As under Alternatives 2 and 3, construction activities under Alternative 4 would disturb instream sediments and soils adjacent to waterways. Work would be completed over a shorter period (2–3 years) under this alternative than under Alternative 2 or Alternative 3. As under Alternative 2, it is expected that cost savings would be realized and water quality protection would be simplified if all in-channel work (from bridge demolition through streambank revegetation) were conducted concurrently within each designated work reach, and that work reaches would be constructed sequentially along the river (probably from upstream to downstream so that the replacement bridge near the upstream end would be constructed during year 1).

The approach to dewatering in each work reach might vary by anticipated treatment, reach length, and flow conditions. The reaches that are proposed to have an anchored high-gradient riffle (at the upstream and downstream ends of the entire project) or to have armored riffles and inset floodplains (by the replacement bridge) would likely be dewatered using diversion structures and piped bypass of the entire streamflow. Reaches where extensive streambank treatment between widely spaced boulder steps is proposed these areas might be dewatered using diversion structures and a center barrier, to bypass flow along either the left or right bank within each work reach.

Any resulting erosion or disturbance of instream sediments and soils could temporarily increase turbidity and sedimentation downstream of the construction sites throughout the study area if soils were transported in the river flows or stormwater runoff. The potential also exists for contaminants used in construction activities to be accidentally introduced into the water system, either directly through spills or incrementally through surface runoff, from work within or immediately adjacent to the channel. Several measures would be implemented as part of the project to minimize potential effects on water quality. As under Alternative 2, project construction activities under Alternative 4 could result in increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants, which could reduce or adversely affect aquatic habitat and populations, including salmonids and other native species. However, because the duration and magnitude of construction would be less under Alternative 4 than under Alternative 2, the resulting effects would also be reduced.

Direct Disturbance and Temporary Loss of Habitat during Construction Activities

Several aspects of project construction under Alternative 4 would require dewatering of the active channel to allow access to and removal of riparian vegetation that provides important shade and cover. These activities and the associated effects on fish and aquatic habitats would be similar to those described for Alternative 2. However, under Alternative 4, more of the project construction activities than under Alternative 2 or Alternative 3 would require dewatering of the active channel. Some water would be diverted during year 2 for channel seasoning of historic meanders completed in year 1 and to be reconnected after channel seasoning.

Initial Channel Response

After the completion of construction activities, changes associated with river stabilization activities would be realized immediately. Because the approach would be to stabilize the channel in place by using bank treatments and grade controls, the channel would not be expected to go through a substantial initial geomorphic response.

Impact Summary

As under Alternatives 2 and 3, project construction activities under Alternative 4 could result in intermittently increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants. These would be potential short-term, temporary effects. Such exposure could reduce or adversely affect aquatic habitat and populations, including salmonids and other native species. Alternative 4 includes a suite of measures, including BMPs, that would minimize this potential effect. Construction would include dewatering activities that would result in the temporary loss of aquatic habitat. Fish and macroinvertebrates could become stranded during dewatering activities, and habitat could dry out or predation by birds or mammals could occur; or the organisms would be injured or killed by heavy equipment during site access, preparation, or construction activities. Because the approach of Alternative 4 would be to stabilize the channel in place by using bank treatments and grade controls, the channel would not be expected to go through a substantial initial geomorphic response. This impact would be significant.

Mitigation Measure 3.5-1A (Alt. 4): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.5-1A (Alt. 2).

Mitigation Measure 3.5-1B (Alt. 4): Implement Preconstruction Surveys for Western Pearlshell Mussels.

This mitigation measure is identical to Mitigation Measure 3.5-1B (Alt. 2).

Mitigation Measure 3.5-1C (Alt. 4): Develop and Implement Native-Fish and Mussel Capture and Translocation Plan.

This mitigation measure is identical to Mitigation Measure 3.5-1C (Alt. 2).

Mitigation Measure 3.5-1D (Alt. 4): Limit Potential Localized Channel Erosion in the Upper Truckee River and Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.5-1D (Alt. 2).

Mitigation Measure 3.5-1E (Alt. 4): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.5-1E (Alt. 2).

With the measures described above, potential short-term adverse effects on aquatic habitat would be avoided and/or minimized, or corrective actions would be implemented. Therefore, with implementation of Mitigation Measures 3.5-1A (Alt. 4) through 3.5-1E (Alt. 4), Impact 3.5-1 (Alt. 4) would be less than significant.

IMPACT 3.5-2 (Alt. 4)	Long-Term Changes to Fish and Aquatic Habitat. *River stabilization activities under Alternative 4 would reduce the ongoing adverse effects on aquatic habitats and the fish community in the Upper Truckee River. These beneficial effects would result from the removal of bridges, the use of biotechnical approaches to stabilize banks where possible, increased habitat structure and complexity, and reduction of sediment inputs into the river associated with existing, ongoing bank erosion. This effect would be* ***beneficial****.*

As described above, Alternative 4 would use a combination of hard and soft stabilization to keep the river in its present configuration and would include only minor changes to the existing golf course. Three of the existing bridges would remain in place while the two upstream bridges would be replaced by one longer bridge. The stream channel's existing longitudinal profile and plan form would remain under Alternative 4. Bank treatment and grade control areas were selected to achieve localized stability and minimize damage from erosion and sudden changes in channel position. River stabilization activities under Alternative 4 would not increase the length of the channel or the width of the riparian corridor, and would not restore natural geomorphic processes within the study area. However, the stabilization measures would contribute to a small incremental improvement to fish and aquatic resources by limiting future sediment inputs and creating some additional habitat complexity where biotechnical approaches would be applied. For example, 18–21 boulder steps and approximately 7,400 linear feet of biotechnical bank treatments would be applied throughout the study area. Further, creating a relatively small area of inset floodplain (0.4 acre) would result in localized improvement of conditions supporting the development of additional riparian cover and providing high-flow refugia for fish. Although the effect would be less than under Alternatives 2, 3 and 5, this effect would be beneficial.

No mitigation is required.

IMPACT 3.5-3 (Alt. 4)	**Short-Term, Construction-Related Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ).** *Implementing Alternative 4 would result in the removal of riparian and meadow vegetation along the Upper Truckee River and placement of fill into the active channel for stabilization of the river. This impact would be **potentially significant**.*

Under Alternative 4, streambank erosion throughout the treatment reach would be reduced by installing protection measures, generally featuring rock armor on outside bends and biotechnical measures on inside bends. Effects on sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ) would be similar in type to those described under Impact 3.5-3 (Alt. 2) for Alternative 2, but would be less in extent because a smaller area would be affected by the activities. No changes are proposed on the west side of the Upper Truckee River outside of the historic meander belt, including no changes to the quarry ponds. Please refer to Impact 3.5-3 (Alt. 2) for a detailed description of potential effects.

Under Alternative 4, riverbank stabilization would be implemented along approximately 7,400 feet of stream channel, and the two golf course bridges at holes 6 and 7 would be removed and replaced by a single bridge as under Alternative 2. Because the golf course would not be relocated west of the river and the quarry wetlands would not be restored under Alternative 4, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected. Under this alternative, sensitive habitat types, including SEZ, would be temporarily disturbed and fill material would be placed into jurisdictional waters of the United States, including wetlands subject to USACE jurisdiction under CWA Section 404. This impact would be potentially significant. No project-related activities would occur west of the Upper Truckee River historic meander belt under Alternative 4, including areas near the spring complexes (including fens).

Mitigation Measure 3.5-3A (Alt. 4): Conduct Delineation of Waters of the United States and Obtain Authorization of Fill and Required Permits.

This mitigation measure is identical to Mitigation Measure 3.5-3A (Alt. 2).

Mitigation Measure 3.5-3B (Alt. 4): Implement Vegetation Protection Measures and Revegetate Disturbed Areas.

This mitigation measure is identical to Mitigation Measure 3.5-3B (Alt. 2).

With the measures described above, sensitive habitats would be identified, and the project would compensate for their loss and identify measures for increasing riparian and wetland vegetation implementation. Therefore, with implementation of Mitigation Measures 3.5-3A (Alt. 4) and 3.5-3B (Alt. 4), Impact 3.5-3 (Alt. 4) would be less than significant.

IMPACT 3.5-4 (Alt. 4)	**Short-Term, Construction-Related Disturbance or Removal of Special-Status Plants.** *Alternative 4 would involve temporary disturbance and removal of plant communities that provide suitable habitat for several special-status plant species known to occur in the vicinity of the study area. While surveys to date have not detected these species, focused surveys to confirm absence would not be conducted until the project permitting phase. Because suitable habitat exists where ground disturbance could occur, implementing Alternative 4 could result in removal or disturbance of special-status plant species. This impact would be **potentially significant**.*

Effects on special-status plants would be similar to those described under Impact 3.5-4 (Alt. 2) for Alternative 2. The potential effects would be the same where disturbance activities would take place for the bank stabilization treatments. Because the extent of ground-disturbing activities would be less than under Alternatives 2 and 3 the potential effects would be less severe. Removal of native vegetation during construction would be minimized under Alternative 4. However, focused surveys for special-status plants have not been conducted throughout all suitable habitat where ground disturbance could occur. Therefore, construction activities associated with the bank stabilization treatments could have a substantial adverse effect on plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS. This impact would be potentially significant.

Mitigation Measure 3.5-4 (Alt. 4): Conduct Follow-up, Pre-construction, Focused Surveys and Avoid, Minimize, or Compensate for Impacts on Special-Status Plants.

This mitigation measure is identical to Mitigation Measure 3.5-4 (Alt. 2).

With the measure described above, the project would avoid the loss of special-status plant species. Therefore, with implementation of Mitigation Measure 3.5-4 (Alt. 4), Impact 3.5-4 (Alt. 4) would be less than significant.

IMPACT 3.5-5 (Alt. 4)	Long-Term Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ) and Special-Status Plant Species. *Streambank stabilization and biotechnical treatments along 7,400 feet of channel are expected to reduce erosion of banks along the Upper Truckee River, which could allow for an eventual increase of riparian vegetation. Creating a small inset floodplain would also increase cover of riparian vegetation. This effect would be* **beneficial**.

Proposed river stabilization activities associated with Alternative 4 would not increase the length of the channel or the width of the riparian corridor, and would not restore natural geomorphic processes within the study area. However, the biotechnical measures would contribute to a small increase in riparian vegetation. The relatively small area of inset floodplain creation (0.4 acre) would result in an increase in the acreage of sensitive habitats. Although the magnitude of the increase would be relatively small, this would be a beneficial effect. No construction disturbance related to golf course reconfiguration, quarry restoration, or trail development would occur on the west side of the Upper Truckee River under this alternative; therefore, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected.The biotechnically treated areas and the small area of inset floodplain created has the potential to become suitable habitat for special-status plant species that have potential to occur within the area. Marsh skullcap, Oregon fireweed, and Bolander's candle moss, discussed under Impact 3.5-4 (Alt. 2), have potential to occur in moist riparian habitats and would benefit from the long-term increase in this habitat type. Although the effects would be considerably smaller than effects under Alternative 2, 3, or 5, this effect would be beneficial.

No mitigation is required.

IMPACT 3.5-6 (Alt. 4)	Tree Removal and Forest Land Conversion. *Implementing Alternative 4 would result in the loss of an estimated 555 native trees greater than 10 inches DBH, including 420 trees for bank stabilization and biotechnical treatments, 100 trees for access road construction, and 35 trees for bridge construction. None of the tree removal would involve conversion of forest to non-forest uses and no old growth forest systems would be affected. This preliminary estimate of trees removed includes five trees greater than 30 inches DBH. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The magnitude of proposed tree removal in the study area is considered "substantial" as defined in the TRPA Code of Ordinances. Implementing Alternative 4 would require a tree removal and management plan developed with TRPA. Substantial tree removal and the loss of trees greater than 30 inches DBH would be a* **significant** *impact.*

Implementing Alternative 4 would involve bank stabilization, biotechnical treatments, and numerous grade control features on approximately 7,400 feet of the Upper Truckee River. Effects on trees within the riparian corridor would be similar to those described in Impact 3.5-6 (Alt. 2) for Alternative 2. Because Alternative 4 does not involve creating new golf course holes or removing trees from upland forest habitat west of the Upper Truckee River, forest land conversion to golf course would not occur and substantially fewer trees would be removed under this alternative than under Alternative 2. Because of the extensive construction proposed along the existing channel, more trees would be removed under this alternative than under Alternative 3. Implementing Alternative 4 would result in the removal of approximately 555 native trees greater than 10 inches DBH, including 420 trees for bank stabilization and biotechnical treatments, 100 trees for access road construction, and 35 trees for bridge construction. This estimate includes five trees greater than 30 inches DBH that would be removed for bank stabilization (4 trees) and bridge construction (1 tree). However, trees to be removed under Alternative 2 will not affect an old growth forest. Tree removal estimates were calculated by State Parks, as discussed in Impact 3.5-6 (Alt. 2) for Alternative 2. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction.

The tree removal estimates for Alternative 4 include trees that may be removed in the future for additional vegetation management and fuels treatments prior to, or in the absence of, project implementation. For example, some lodgepole pines that would be removed within the riparian corridor as part of bank stabilization and biotechnical treatments under Alternative 4 would be removed as part of State Parks' existing management to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project), and as part of the Lake Sector Wildfire Management Plan. Removal of conifers from SEZs for riparian hardwood enhancement is a specific land management objective of State Parks, and some of the tree removal implemented under Alternative 4 would have a long-term beneficial ecological effect.

Provisions for tree removal are provided in the TRPA Code of Ordinances (Chapter 71, and Chapters 30, 65, 75, and 77), and tree removal requires the review and approval of TRPA. TRPA defines "substantial" tree removal as "activities on project areas of twenty acres or more and proposing the removal of more than 100 live trees 10 inches DBH or larger, or proposing the removal of more than 100 live trees 10 inches DBH or larger within land capability districts 1a, 1b, 1c, 2, or 3 regardless of the project area, or proposing tree removal that, as determined by TRPA after a joint inspection with appropriate State or Federal forestry staff, does not meet the minimum acceptable stocking standards set forth in Subsection 71.4.B" (TRPA Code of Ordinances, Section 71.4.I). Additionally, trees greater than 30 inches DBH must be retained, except under circumstances specified in the Code of Ordinances.

The magnitude of estimated tree removal (555 native trees greater than 10 inches DBH) under Alternative 4 would be substantial as defined by TRPA; and approximately five trees greater than 30 inches DBH would be removed. This impact would be significant.

Mitigation Measure 3.5-6 (Alt. 4): Minimize Tree Removal and Develop a Tree Removal and Management Plan

This mitigation measure is identical to Mitigation Measure 3.5-6 (Alt. 2).

With the measure described above, the project would minimize tree removal and compensate, as needed, for the significant loss of trees. Therefore, with implementation of Mitigation Measure 3.5-6 (Alt. 4), Impact 3.5-6 (Alt. 4) would be less than significant.

IMPACT 3.5-7 (Alt. 4) **Introduction and Spread of Weeds and Aquatic Invasive Species.** *Implementing Alternative 4 has the potential to introduce and spread invasive weeds and aquatic invasive species during the initial phases of project construction and implementation. The introduction and spread of invasive weeds or aquatic invasive species would degrade vegetation and wildlife habitat, including wildlife habitats of special significance (riparian) within the study area. Implementation of the golf course's existing weed management plan would continue and would sufficiently prevent the spread of nonnative plants within areas of native vegetation during operation of the golf course. Introduction and spread of invasive weeds and aquatic invasive species during construction and revegetation would be a* ***potentially significant*** *impact.*

Alternative 4 would involve bank stabilization treatments, biotechnical treatments, and numerous grade control features on approximately 7,400 feet of the channel. Ground disturbance and in-channel construction within the Upper Truckee River from these activities has the potential to introduce and spread invasive weeds and aquatic invasive species during the initial phases of project construction and implementation. Alternative 4 would involve less ground disturbance than Alternatives 2 and 3; however, because some ground-disturbing activities and in-channel construction would occur, effects from the introduction and spread of weeds and aquatic invasive species would be less than but similar to those described under Impact 3.5-7 (Alt. 2) for Alternative 2. Please refer to Impact 3.5-7 (Alt. 2) for a detailed description of the potential impact. Because Alternative 4 would involve ground disturbance, in-channel construction, and the movement of construction equipment into the study area from potentially weed or aquatic invasive species infested areas, this short-term construction-related impact would be potentially significant.

Alternative 4 would involve only minor changes to the existing golf course. The weed management plan for the existing golf course is expected to sufficiently prevent the long-term spread of nonnative plants from the golf course into adjacent areas of native vegetation.

Mitigation Measure 3.5-7A (Alt. 4): Implement Weed Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7A (Alt. 2).

Mitigation Measure 3.5-7B (Alt. 4): Implement Aquatic Invasive Species Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7B (Alt. 2).

With the measures described above, weed and aquatic invasive species management practices would be implemented during project construction and the inadvertent introduction and spread of weeds or aquatic invasive species from project construction would be prevented. Therefore, with implementation of Mitigation Measure 3.5-7A (Alt. 4) and 3.5-7B (Alt.4), Impact 3.5-7 (Alt. 4) would be less than significant.

IMPACT 3.5-8 (Alt. 4) **Short-Term, Construction-Related Disturbance or Loss of Special-Status Wildlife Species and Habitats.** *Under Alternative 4, riverbank stabilization activities along 7,400 feet of channel and bridge replacement could result in loss of individuals or nests, or disruptions to nesting attempts of five special-status bird species (yellow warbler, olive-sided flycatcher, osprey, long-eared owl, and waterfowl species); potential disturbance of future nesting by willow flycatcher; and removal of active roost sites for, or injury to, western red bat. This impact would be* ***potentially significant*** *for species known to be present and for willow flycatcher and western red bat, if the species nests or roosts, respectively, in the study area in the future where construction would occur.*

Alternative 4 would primarily include riverbank stabilization along 7,400 feet of the Upper Truckee River. Also, two bridges that span the Upper Truckee River would be replaced by one longer bridge. Construction activities could result in disturbance or loss of the nests of yellow warbler, olive-sided flycatcher, willow flycatcher, waterfowl, or long-eared owl, and removal of roost sites for western red bat. All of these special-status species could use the Upper Truckee River corridor for breeding habitat. This impact would be similar to that described for the river and floodplain restoration component of Impact 3.5-8 (Alt. 2) under Alternative 2. Please refer to Impact 3.5-8 (Alt. 2) for a detailed description of the potential impact mechanisms related to these species. Because the existing golf course would not be reconfigured under Alternative 4, occupied yellow-headed blackbird habitat at the pond west of hole 4 would not be affected and impacts to this species are not expected.

Under Alternative 4, no construction disturbance related to golf course relocation or trail development on the west side of the Upper Truckee River would occur; therefore, the amount of potential habitat for long-eared owl and olive-sided flycatcher (which could nest in upland habitats west of the river) affected would be lower under Alternative 4 than under Alternative 2.

Project construction under Alternative 4 could result in the loss of individuals or nests, or disruptions to nesting attempts, of yellow warbler, olive-sided flycatcher, waterfowl, or long-eared owl; potential disturbance of willow flycatcher if the species nests in a construction area in the future; and the removal of an active roost site for, or injury to, western red bat. This impact would be potentially significant for species known to inhabit the study area and for willow flycatcher and western red bat, if they use the habitat in the future.

Mitigation Measure 3.5-8A (Alt. 4): Conduct Preconstruction Surveys for Nesting Special-Status Birds (Yellow Warbler, Willow Flycatcher, Olive-Sided Flycatcher, Waterfowl, and Long-Eared Owl), and Implement a Limited Operating Period If Necessary.

This mitigation measure is similar to Mitigation Measure 3.5-8A (Alt. 2). Because impacts to yellow-headed blackbird are not expected under Alternative 4, preconstruction surveys for this species would not be required for this alternative.

Mitigation Measure 3.5-8B (Alt. 4): Conduct Preconstruction Surveys for Special-Status Bats, Avoid Removal of Significant Roosts, and Implement a Limited Operating Period If Necessary.

This mitigation measure is identical to Mitigation Measure 3.5-8B (Alt. 2).

With the measures described above, the project would avoid the loss of individuals, nests, or roost sites of special-status wildlife species during construction. Therefore, with implementation of Mitigation Measures 3.5-8A (Alt. 4) and 3.5-8B (Alt. 4), Impact 3.5-8 (Alt. 4) would be less than significant.

IMPACT 3.5-9 (Alt. 4)	Long-Term Effects on Special-Status and Common Wildlife Species and Habitats. *Streambank stabilization along 7,400 feet of channel is expected to reduce sediment inputs and enhance instream habitat complexity for aquatic wildlife. Creating a small inset floodplain would improve riparian cover, which provides habitat for common and special-status species such as yellow warbler. This effect would be* ***beneficial****.*

River stabilization activities associated with Alternative 4 would not increase the length of the channel or the width of the riparian corridor, and would not restore natural geomorphic processes within the study area. However, the stabilization measures would contribute to a small improvement to aquatic resources by limiting future sediment inputs and creating some additional habitat complexity where biotechnical approaches could be applied. This would improve instream habitat conditions for aquatic wildlife such as amphibians. The relatively small area of inset floodplain created (0.4 acre) would result in localized improvement of conditions supporting the development of riparian cover, which provides habitat for several common and special-status wildlife species. Although the magnitude of the effect would be small compared to long-term effects of Alternatives 2, 3, and 5, this effect would be beneficial.

No mitigation is required.

IMPACT 3.5-10 (Alt. 4) **Effects on Potential Wildlife Movement Corridors.** *Under Alternative 4, a small increase in riparian habitat quality is expected as a result of riverbank stabilization, biotechnical treatments, and creation of inset floodplain along the Upper Truckee River. This could result in a small improvement to the SEZ's localized wildlife corridor function. This effect would be* ***beneficial****.*

Please refer to Impact 3.5-10 (Alt. 2) for a discussion of the potential for the Upper Truckee River corridor to function as a wildlife movement corridor, and how habitat enhancement there could improve this function. As discussed in Impact 3.5-9 (Alt. 4), the riverbank stabilization measures in Alternative 4 would contribute to a small improvement to aquatic resources by limiting future sediment inputs and creating some additional habitat complexity where biotechnical approaches could be applied. This would improve instream habitat conditions for aquatic wildlife such as amphibians. The relatively small area of inset floodplain created (0.4 acre) would result in localized improvement of conditions that would support the development of riparian cover. These habitat enhancements could result in a small increase in wildlife use and potential corridor function of the SEZ, although Alternative 4 would not actively create a continuous riparian corridor. Although the magnitude of the effect would be small relative to long-term effects of Alternatives 2, 3, and 5, the increased potential for the Upper Truckee River SEZ to function as a wildlife movement corridor would be beneficial.

Under Alternative 4, no habitat loss or potential wildlife corridor disturbance related to golf course relocation or trail development on the west side of the Upper Truckee River would occur. Therefore, no degradation or disturbance of the Upper Truckee River corridor would be caused by development of a new golf course west of the river (i.e., edge effects of golf course development) under Alternative 4.

For the reasons described above, this effect would be beneficial.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.5-1 (Alt. 5) **Short-Term Degradation of Fish and Aquatic Habitat Resulting from Construction and Initial Channel Response.** *Alternative 5 construction activities could result in temporary adverse effects on water quality, aquatic habitats, and the aquatic community. Effects could also occur during the initial channel-response period within the study area and in areas downstream. This impact would be* ***significant****.*

Alternative 5 proposes to decommission and remove the 18-hole regulation golf course and restore the golf course footprint to meadow and riparian habitat. Under this alternative the river would be restored in a similar manner to Alternatives 2 and 3. A 13,430-foot reach of the Upper Truckee River and adjoining floodplain would be restored. All five Upper Truckee River bridges, the four Angora Creek bridges, and the four cart path bridges on the unnamed creek would be removed. Golf holes would be removed from sensitive lands adjacent to the river and the area farther away from the river, and the footprint would be restored as native meadow and riparian habitat. The clubhouse facility, parking area, and maintenance yard would remain with the clubhouse available for public use. If economically feasible, a 9-hole golf course may remain in use while State Parks evaluates alternative uses of the Lake Valley SRA and Washoe Meadows SP.

Water Quality: Sedimentation and Turbidity, Release and Exposure of Contaminants

As under Alternatives 2 and 3, construction activities under Alternative 5 would disturb instream sediments and soils adjacent to waterways. Construction would occur in phases over a 3- to 4-year period. Year 1 would focus on off-channel work. If a temporary 9-hole course were to remain, golf play either would be limited to the east side of the river to allow construction access adjacent to the river during all years of construction, or would be removed during the first year of construction. It is anticipated that in year 2 of construction, most off-channel river restoration work would be completed and vegetation would be allowed to properly establish. No additional construction activities would occur in year 2. Removal of the bridges, in-channel work, and connection of historic meanders and new channel sections would take place during year 3.

Any resulting erosion or disturbance of instream sediments and soils could intermittently increase turbidity and sedimentation downstream of the construction sites throughout the study area if soils were transported in the river flows or stormwater runoff. These would be potential short-term, temporary effects. The potential also exists for contaminants used in construction activities to be accidentally introduced into the water system, either directly through spills or incrementally through surface runoff, from work within or immediately adjacent to the channel. Several measures would be implemented as part of the project to minimize potential effects on water quality. (See Chapter 2, "Project Alternatives," and Section 3.4, "Geomorphology and Water Quality," for additional discussion of this issue.) Potential effects on fish and aquatic habitat would be similar to those described for Alternative 2.

Direct Disturbance and Temporary Loss of Habitat during Construction Activities

Several aspects of project construction under Alternative 5 would require dewatering of the active channel to allow access to and removal of riparian vegetation that provides important shade and cover. These activities and the associated effects of fish and aquatic habitats would be similar to those described under Alternative 2 except that the channel disturbance would be less severe. Dewatering would occur only during year 3 and possibly in year 4. Some water would be diverted during year 2 for channel seasoning of off-channel sections completed in year 1.

Initial Channel Response

After the completion of construction activities, some habitat improvements associated with river ecosystem restoration activities would be realized immediately. However, the new physical form of the channel and associated floodplain would also result in immediate changes to hydraulic conditions, which in turn would result in a geomorphic response for some period of time until a new dynamic equilibrium was reached. Depending on the specific, localized circumstances, localized changes in water velocities and sediment transport and depositional patterns could occur. Because the geomorphic response is process driven and subject to several highly variable conditions (e.g., frequency, duration, and magnitude of intermediate- to high-flow events; local sediment grain sizes; local channel geometry), it can be extremely difficult to predict the nature and extent of short-term (interim) outcomes. Nevertheless, as described for Alternative 2, it is possible that some aquatic habitat conditions could become degraded during the channel's initial response to the changed physical condition.

Impact Summary

As under Alternatives 2–4, project construction activities under Alternative 5 could result in increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants. Such exposure could reduce or adversely affect aquatic habitat and populations, including salmonids and other native species. Alternative 5 includes a suite of measures, including BMPs that would minimize this potential effect. Construction would include dewatering activities that would result in the temporary loss of aquatic habitat. Fish and macroinvertebrates could become stranded during dewatering activities, and habitat could dry out or predation by birds or mammals could occur; or the organisms would be injured or killed by heavy equipment during site access, preparation, or construction activities. Lastly, implementing Alternative 5 could result in short-term adverse effects on aquatic habitats because the river channel's geomorphic response would affect sediment transport and deposition processes during the initial channel-response period. This impact would be significant.

Mitigation Measure 3.5-1A (Alt. 5): Prepare and Implement Effective Site Management Plans.

This mitigation measure is identical to Mitigation Measure 3.5-1A (Alt. 2).

Mitigation Measure 3.5-1B (Alt. 5): Implement Preconstruction Surveys for Western Pearlshell Mussels.

This mitigation measure is identical to Mitigation Measure 3.5-1B (Alt. 2).

Mitigation Measure 3.5-1C (Alt. 5): Develop and Implement Native-Fish and Mussel Capture and Translocation Plan.

This mitigation measure is identical to Mitigation Measure 3.5-1C (Alt. 2).

Mitigation Measure 3.5-1D (Alt. 5): Limit Potential Localized Channel Erosion in the Upper Truckee River and Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.5-1D (Alt. 2).

Mitigation Measure 3.5-1E (Alt. 5): Provide Bed and Bank Stabilization Measures at and Immediately Upstream and Downstream of Bridge Removal Sites.

This mitigation measure is identical to Mitigation Measure 3.5-1E (Alt. 2).

Mitigation Measure 3.5-1F (Alt. 5): Ensure Bed and Bank Stability Downstream of the Treated Reaches.

This mitigation measure is identical to Mitigation Measure 3.5-1F (Alt. 2).

Mitigation Measure 3.5-1G (Alt. 5): Ensure Bed and Bank Stability in the Lower Reaches of the Two Tributary Creeks.

This mitigation measure is identical to Mitigation Measure 3.5-1G (Alt. 2).

Mitigation Measure 3.5-1H (Alt. 5) Monitor and Supplement Coarse Sediment Delivery Downstream and Monitor Instream Habitat Conditions.

This mitigation measure is identical to Mitigation Measure 3.5-1H (Alt. 2).

With the measures described above, potential short-term adverse effects on aquatic habitat would be avoided and/or minimized, or corrective actions would be implemented. Therefore, with implementation of Mitigation Measures 3.5-1A (Alt. 5) through 3.5-1H (Alt. 5), Impact 3.5-1 (Alt. 5) would be less than significant.

IMPACT 3.5-2 (Alt. 5)	**Long-Term Changes to Fish and Aquatic Habitat.** *River restoration activities under Alternative 5 would result in long-term beneficial effects on aquatic habitats and the fish community in the Upper Truckee River. These beneficial effects would result from several changes: the removal of encroachments in the SEZ and channel; improved conditions for riffle and pool complexes and substrate through restored geomorphic processes; improved floodplain connectivity and access to secondary channels; increased habitat structure and complexity; reduced sediment inputs into the river associated with existing, ongoing bank erosion; and reduced inputs of fertilizers and other pollutants used in golf course turf management. This effect would be* ***beneficial****.*

River restoration under Alternative 5 would substantially increase the length of the channel and the width of the riparian corridor, and would restore natural processes within the project area, resulting in more available habitat for the fish and macroinvertebrate community. Increased sinuosity would improve pool development and maintenance, and a wider and more vigorous riparian vegetation community would lead to increased riparian cover and instream complexity with the introduction of woody debris. As under Alternative 2, many of the benefits of the restoration project would be realized over time, as functional geomorphic processes shape channel morphology and associated habitat features that provide important functions and values to the fish and macroinvertebrate community. These processes, which rely on regular disturbance resulting from flood events, would result in improvements in aquatic habitat functions and values over a period of several decades, and would assure that aquatic habitat would be maintained over time. Other improvements in water quality and associated aquatic habitat conditions would result from decommissioning and removal of the golf course because the use of fertilizers and other pollutants used in golf course turf management would be discontinued. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-3 (Alt. 5)	**Short-Term, Construction-Related Disturbance or Loss of Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens, and SEZ).** *Implementing Alternative 5 would result in the removal of riparian and meadow vegetation along the Upper Truckee River and placement of fill into the active channel. This impact would be **significant**.*

Alternative 5 would involve the same geomorphic restoration treatments as those described in Alternatives 2 and 3. Therefore, effects on sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ) would be similar to those described in Impact 3.5-3 (Alt. 2) and Impact 3.5-3 (Alt. 3). Please refer to Impact 3.5-3 (Alt. 2) for a detailed description of potential effects. Alternative 5 would result in restoration of a larger area of SEZ. No construction disturbance related to golf course relocation, quarry restoration, or trail development would occur on the west side of the Upper Truckee River under this alternative; therefore, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected. Under this alternative, sensitive habitat types, including SEZ, would be temporarily disturbed and fill material would be placed into jurisdictional waters of the United States, including wetlands subject to USACE jurisdiction under CWA Section 404. This impact would be significant.

Mitigation Measure 3.5-3A (Alt. 5): Conduct Delineation of Waters of the United States and Obtain Authorization of Fill and Required Permits.

This mitigation measure is identical to Mitigation Measure 3.5-3A (Alt. 2).

Mitigation Measure 3.5-3B (Alt. 5): Implement Vegetation Protection Measures and Revegetate Disturbed Areas.

This mitigation measure is identical to Mitigation Measure 3.5-3B (Alt. 2).

With the measures described above, sensitive habitats would be identified and the project would compensate for their loss and define measures for increasing riparian and wetland vegetation. Therefore, with implementation of Mitigation Measures 3.5-3A and 3.5-3B (Alt. 5), Impact 3.5-3 (Alt. 5) would be less than significant.

IMPACT 3.5-4 (Alt. 5)	**Short-Term, Construction-Related Disturbance or Removal of Special-Status Plants.** *Alternative 5 would involve temporary disturbance and removal of plant communities that provide suitable habitat for several special-status plant species known to occur in the vicinity of the study area. While surveys to date have not detected these species, focused surveys to confirm absence would not be conducted until the project permitting phase. Because suitable habitat exists where ground disturbance could occur, implementing Alternative 5 could result in removal or disturbance of special-status plant species. This impact would be **potentially significant**.*

Alternative 5 would involve the same geomorphic restoration treatments within suitable habitat for special-status plants as those described for Alternatives 2 and 3. As a result, effects of Alternative 5 on special-status plants would be similar to those described in Impact 3.5-4 (Alt. 2) and Impact 3.5-4 (Alt. 3). Please refer to Impact 3.5-4 (Alt. 2) for a detailed description of potential effects. This impact would be potentially significant.

Mitigation Measure 3.5-4 (Alt. 5): Conduct Follow-up, Pre-construction, Focused Surveys and Avoid, Minimize, or Compensate for Impacts on Special-Status Plants.

This mitigation measure is identical to Mitigation Measure 3.5-4 (Alt. 2).

With the measure described above, the project would avoid the loss of special-status plant species. Therefore, with implementation of Mitigation Measure 3.5-4 (Alt. 5), Impact 3.5-4 (Alt. 5) would be less than significant.

IMPACT 3.5-5 (Alt. 5)	Long-Term Effects on Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, Fens and SEZ) and Special-Status Plant Species. *The long-term goal of the project under Alternative 5 is to achieve a net increase of SEZ, floodplain meadow vegetation, and wetland area and functions. Alternative 5 would restore approximately 131.5 acres of floodplain meadow vegetation and 123 acres of SEZ. This effect would be* ***beneficial****.*

Under Alternative 5, the existing golf course would be decommissioned and ecosystem processes along the Upper Truckee River would be restored in a manner similar to Alternatives 2 and 3. Approximately 131.5 acres of floodplain/meadow and 123 acres of SEZ would be restored. If economically feasible, a 9-hole golf course may remain in use while State Parks evaluates alternative uses of the SRA. If keeping the temporary 9-hole course in place during the additional planning process were found to be infeasible, the entire golf course would be removed and meadow and riparian habitat reestablished. Areas within the active floodplain that are currently disturbed by golf course infrastructure and associated use would be restored to riparian habitat, using the same approach as under Alternatives 2 and 3. The net increase of 123 acres of restored SEZ and 131.5 acres of restored floodplain and meadow vegetation would be greater than under Alternatives 2, 3, and 4. The increased size and improved ecosystem functions of SEZ, floodplain, and wetland communities would be beneficial because they would result in a long-term net increase of sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ). No construction disturbance related to golf course relocation, quarry restoration, or trail development would occur on the west side of the Upper Truckee River under this alternative; therefore, spring complexes (including fens) and other sensitive habitats west of the Upper Truckee River riparian corridor and floodplain would not be affected.In addition, areas of restored SEZ and floodplain meadow vegetation would increase the area of suitable habitat for special-status plant species that have potential to occur within the area. Marsh skullcap, Oregon fireweed, and Bolander's candle moss, discussed under Impact 3.5-4 (Alt. 2), have potential to occur in moist riparian habitats and would benefit from the long term increase in this habitat type. A nearby population of marsh skullcap in Washoe Meadows SP responded favorably to a restoration project along Angora Creek and grows vigorously along the newly created banks of that creek. The increased size of SEZ, floodplain, and wetland communities could provide additional habitat for these species. This effect would be beneficial.

No mitigation is required.

IMPACT 3.5-6 (Alt. 5)	Tree Removal and Forest Land Conversion. *Implementing Alternative 5 would result in the loss of an estimated 245 native trees greater than 10 inches DBH, including 120 trees for geomorphic restoration and 125 trees for construction of access roads. None of the tree removal would involve conversion of forest to non-forest uses and no old growth forest systems would be affected. This preliminary estimate of trees removed includes two trees greater than 30 inches DBH. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The magnitude of proposed tree removal in the study area is considered "substantial" as defined in the TRPA Code of Ordinances. Implementing Alternative 5 would require a tree removal and management plan developed with TRPA. Substantial tree removal and the loss of trees greater than 30 inches DBH would be a* ***significant*** *impact.*

Alternative 5 would involve geomorphic restoration treatments similar to those described for Alternatives 2 and 3. As a result, under Alternative 5, effects on trees resulting from this component of the project would be essentially the same those described in Impact 3.5-6 (Alt. 2) and Impact 3.5-6 (Alt. 3). Under Alternative 5, tree removal in the Upper Truckee River riparian zone would be similar to that described under Impact 3.5-6 (Alt. 2) for

Alternative 2. Because Alternative 5 does not involve creating new golf course holes or removing trees from upland forest habitat west of the Upper Truckee River, forest land conversion to golf course would not occur and substantially fewer trees would be removed under this alternative than under Alternative 2. Implementing Alternative 3 would result in the removal of approximately 245 native trees greater than 10 inches DBH, including 120 trees for geomorphic restoration and 125 trees for construction of access roads. This estimate includes two trees greater than 30 inches DBH that would be removed for geomorphic restoration. However, trees to be removed under Alternative 2 will not affect an old growth forest. Tree removal estimates were calculated by State Parks, as discussed in Impact 3.5-6 (Alt. 2) for Alternative 2. The final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction.

The tree removal estimates for Alternative 5 include trees that may be removed in the future for additional vegetation management and fuels treatments prior to, or in the absence of, project implementation. For example, some lodgepole pines that would be removed within the riparian corridor as part of the geomorphic restoration under Alternative 5 would be removed as part of State Parks' existing management to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project), and as part of the Lake Sector Wildfire Management Plan. Removal of conifers from SEZs for riparian hardwood enhancement is a specific land management objective of State Parks, and some of the tree removal implemented under Alternative 5 would have a long-term beneficial ecological effect. Also, as a result of geomorphic, floodplain, and SEZ restoration under Alternative 5, a net increase in riparian tree abundance, cover, and productivity would occur following project implementation.

Provisions for tree removal are provided in the TRPA Code of Ordinances (Chapter 71, and Chapters 30, 65, 75, and 77), and tree removal requires the review and approval of TRPA. TRPA defines "substantial" tree removal as "activities on project areas of twenty acres or more and proposing the removal of more than 100 live trees 10 inches DBH or larger, or proposing the removal of more than 100 live trees 10 inches DBH or larger within land capability districts 1a, 1b, 1c, 2, or 3 regardless of the project area, or proposing tree removal that, as determined by TRPA after a joint inspection with appropriate State or Federal forestry staff, does not meet the minimum acceptable stocking standards set forth in Subsection 71.4.B" (TRPA Code of Ordinances, Section 71.4.I). Additionally, trees greater than 30 inches DBH must be retained, except under circumstances specified in the Code of Ordinances.

Although geomorphic restoration requiring tree removal in Alternative 5 would be ecologically beneficial, the magnitude of estimated tree removal (245 native trees greater than 10 inches DBH) would be substantial as defined by TRPA; and approximately two trees greater than 30 inches DBH would be removed. This impact would be significant.

Mitigation Measure 3.5-6 (Alt. 5): Minimize Tree Removal and Develop a Tree Removal and Management Plan.

This mitigation measure is identical to Mitigation Measure 3.5-6 (Alt. 2).

With the measure described above, the project would minimize tree removal and compensate, as needed, for the significant loss of trees. Therefore, with implementation of Mitigation Measure 3.5-6 (Alt. 5), Impact 3.5-6 (Alt. 5) would be less than significant.

IMPACT 3.5-7 (Alt. 5) **Introduction and Spread of Weeds and Aquatic Invasive Species.** *Implementing Alternative 5 has the potential to introduce and spread invasive weeds and aquatic invasive species during the initial phases of geomorphic restoration and golf course decommissioning. The introduction and spread of invasive weeds or aquatic invasive species would degrade vegetation and wildlife habitat, including wildlife habitats of special significance (riparian) within the study area. Over the long term, restoring the existing golf course to native vegetation would likely reduce the existing risk of weed invasion or spread in the study area. Introduction and spread of invasive weeds and aquatic invasive species during the construction and revegetation phases would be a potentially significant impact. This impact would be* ***potentially significant.***

This impact would be similar to Impact 3.5-7 (Alt. 3) for Alternative 3, because Alternative 5 would involve similar geomorphic restoration of the Upper Truckee River. Please refer to Impact 3.5-7 (Alt. 3) for a detailed description of the potential impact. Additionally, this alternative would include potentially decommissioning the existing golf course and restoring the SEZ, floodplain, and meadow habitat. Golf course decommissioning and restoration would involve temporary ground-disturbing activities on up to 131.5 acres. These ground-disturbing activities could result in the inadvertent introduction and/or spread of nonnative, invasive weed species. The introduction or spread of nonnative, invasive weeds and aquatic invasive species during project construction and revegetation would be a potentially significant impact. Because the existing golf course is considered a potential source point or harbor for weed species, golf course decommissioning and restoration to native vegetation would likely reduce the existing risk of weed invasion or spread into or from the study area. This long-term effect would be beneficial.

Mitigation Measure 3.5-7A (Alt. 5): Implement Weed Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7A (Alt. 2).

Mitigation Measure 3.5-7B (Alt. 5): Implement Aquatic Invasive Species Management Practices during Project Construction.

This mitigation measure is identical to Mitigation Measure 3.5-7B (Alt. 2).

With the measures described above, weed and aquatic invasive species management practices would be implemented during project construction and the inadvertent introduction and spread of weeds or aquatic invasive species from project construction would be prevented. Therefore, with implementation of Mitigation Measure 3.5-7A (Alt. 5) and 3.5-7B (Alt.5), Impact 3.5-7 (Alt. 5) would be less than significant.

IMPACT 3.5-8 (Alt. 5) **Short-Term, Construction-Related Disturbance or Loss of Special-Status Wildlife Species and Habitats.** *Under Alternative 5, restoration activities along the Upper Truckee River and golf course decommissioning could result in loss of individuals or nests, or disruptions to nesting attempts of six special-status bird species (yellow warbler, olive-sided flycatcher, osprey, long-eared owl, yellow-headed blackbird, and waterfowl species); potential disturbance of future nesting by willow flycatcher; and removal of active roost sites for, or injury to, western red bat. This impact would be* ***potentiallysignificant*** *for species known to be present and for willow flycatcher and western red bat, if the species nests or roosts, respectively, in the study area in the future where construction would occur.*

Alternative 5 would involve the same geomorphic restoration treatments as those described for Alternatives 2 and 3. Construction activities could result in disturbance or loss of nests for yellow warbler, willow flycatcher, waterfowl, olive-sided flycatcher, or long-eared owl and removal of roost sites for western red bat. All of these special-status species could use the Upper Truckee River corridor for breeding habitat. Habitat occupied by yellow-headed blackbird (the pond west of hole 4) and adjacent areas could be affected by the proposed golf course decommissioning. These impacts would be similar to those described for the river and floodplain restoration and golf course reconfiguration components of Impact 3.5-8 (Alt. 2) under Alternative 2. Please refer to Impact 3.5-8 (Alt. 2) for a detailed description of potential effects. Under Alternative 5, no construction disturbance related to golf course relocation or trail development on the west side of the Upper Truckee River would occur; therefore, the amount of potential habitat for long-eared owl and olive-sided flycatcher (which could nest in upland habitats west of the river) affected would be lower under Alternative 5 than under Alternative 2.

Project construction under Alternative 5 could result in the loss of individuals or nests, or disruptions to nesting attempts, of yellow warbler, olive-sided flycatcher, yellow-headed blackbird, waterfowl, or long-eared owl; potential disturbance of willow flycatcher if the species nests in a construction area in the future; and the removal of an active roost site for, or injury to, western red bat. This impact would be potentially significant for species known to inhabit the study area and for willow flycatcher and western red bat, if they use the habitat in the future.

Mitigation Measure 3.5-8A (Alt. 5): Conduct Preconstruction Surveys for Nesting Special-Status Birds (Yellow Warbler, Willow Flycatcher, Olive-Sided Flycatcher, Yellow-Headed Blackbird, Waterfowl, and Long-Eared Owl), and Implement a Limited Operating Period If Necessary.

This mitigation measure is identical to Mitigation Measure 3.5-8A (Alt. 2).

Mitigation Measure 3.5-8B (Alt. 5): Conduct Preconstruction Surveys for Special-Status Bats, Avoid Removal of Significant Roosts, and Implement a Limited Operating Period If Necessary.

This mitigation measure is identical to Mitigation Measure 3.5-8B (Alt. 2).

With the measures described above, the project would avoid the loss of individuals, nests, or roost sites of special-status wildlife species during construction of Alternative 5. Therefore, with implementation of Mitigation Measures 3.5-8A (Alt. 5) and 3.5-8B (Alt. 5), Impact 3.5-8 (Alt. 5) would be less than significant.

IMPACT 3.5-9 (Alt. 5)	Long-Term Effects on Special-Status and Common Wildlife Species and Habitats. *The long-term ecosystem response to river and floodplain restoration under Alternative 5 is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. River and floodplain restoration would also substantially increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). This effect would be* ***beneficial****.*

As discussed under Alternatives 2 and 3, river restoration activities under Alternative 5 would substantially increase the length of the channel and the width of the riparian corridor. Natural processes would be restored, resulting in more functional and valuable habitat for terrestrial and aquatic common and sensitive wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. The long-term ecosystem response to river and floodplain restoration under Alternative 5 is expected to provide a more vigorous riparian vegetation community, increased riparian cover, and instream complexity. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). Please refer to Impact 3.5-9 (Alt. 2) for a detailed description of potential effects. Additionally, under Alternative 5, the existing 133-acre golf course would be removed, which would result in restoration of 123 acres of SEZ, 56 acres of 100-year floodplain, and 133 acres of floodplain/meadow. This effect would be beneficial and the magnitude of the benefit would be relatively high.

No mitigation is required.

IMPACT 3.5-10 (Alt. 5)	Effects on Potential Wildlife Movement Corridors. *Under Alternative 5, the substantially increased area and improved ecosystem functions of SEZ, floodplain, and riparian and wetland communities along the Upper Truckee River would benefit wildlife communities. These benefits would improve the SEZ's wildlife corridor function by increasing habitat quality, native vegetation connectivity, and corridor width. This effect would be* ***beneficial****.*

Please refer to Impact 3.5-10 (Alt. 2) for a discussion of the potential for the Upper Truckee River corridor to function as a wildlife movement corridor, and the ways in which habitat enhancement there could improve this function. Alternative 5 would involve the same geomorphic restoration treatments as those described for Alternative 2, and would improve the Upper Truckee River SEZ's potential wildlife corridor function by substantially increasing habitat quality, native vegetation connectivity, and corridor width. This impact would be similar to that described for the river and floodplain restoration component of Impact 3.5-10 (Alt. 2) under Alternative 2. Please refer to Impact 3.5-10 (Alt. 2) for a detailed description of potential effects. Additionally, the existing golf course would be removed, which could result in restoration of up to 123 acres of SEZ, 56 acres of 100-year floodplain, and 131.5 acres of floodplain/meadow. Removal of the existing golf course would also reduce recreation- and maintenance-related disturbances (e.g., noise) to wildlife. However, State Parks would evaluate alternative uses of both Lave Valley SRA and Washoe Meadows SP through a separate planning process. At a minimum, restoration of SEZ, floodplain and meadow would be similar to Alternative 3. This effect would be beneficial.

No mitigation is required.

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3.6 EARTH RESOURCES

This section discusses the regulatory guidance and existing environmental conditions in the study area for earth resources, and evaluates potential environmental effects related to geology, soils, mineral resources, and includes land capability and coverage analysis associated with project implementation. Potential environmental effects related to water quality resulting from soil erosion and other stormwater issues are addressed in Sections 3.2, "Hydrology and Flooding" 3.4, "Geomorphology and Water Quality." Consistency with TRPA goals and policies is presented in Section 3.2, "Land Use," Table 3.2-1. Cumulative earth resources impacts are addressed in Section 3.16, "Cumulative Impacts." The project's effects on thresholds are described in Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.6.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

No Federal plans, policies, regulations, or laws related to earth resources are applicable.

State

Soil and Water Resources Conservation Act of 1977

The Soil and Water Resources Conservation Act of 1977, as amended (RCA) provides the United States Department of Agriculture (USDA) broad strategic assessment and planning authority for the conservation, protection, and enhancement of soil, water, and related natural resources. Through RCA, USDA appraises the status and trends of soil, water, and related resources on non-Federal land and assesses their capability to meet present and future demands; evaluates current and needed programs, policies, and authorities; and develops a national soil and water conservation program to give direction to USDA soil and water conservation activities.

Clean Water Act

The Clean Water Act (CWA) regulates discharges into waters of the United States, including a range of potential point and nonpoint sources of water-transported pollutants, and the discharge of fill into waters such as wetlands and intermittent stream channels. The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters through prevention and elimination of pollution.

The law requires that a CWA Section 404 permit be obtained from the U.S. Army Corps of Engineers (USACE) for any dredged or fill materials discharged into wetlands or waters of the United States whether the discharge is temporary or permanent. A National Pollutant Discharge Elimination System permit is required through the appropriate regional water quality control board (RWQCB) CWA Section 401 requires that water quality certifications or waivers be issued by the U.S. Environmental Protection Agency (EPA), the states, or both (see below). Projects must be consistent with the State Non-point Source Pollution Management Program (CWA Section 319). Projects effecting waterbodies identified as impaired would also need to comply with Section 303(d) of the CWA. Waterbodies subject to Section 303(d) of the CWA are discussed further in Section 3.4, "Geomorphology and Water Quality."

Clean Water Act (CWA) Section 402 mandates that certain types of construction activity comply with the requirements of Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES) stormwater program. Construction activities that disturb one or more acres of land must obtain coverage under the NPDES general construction activity stormwater permit, which is issued by the RWQCB. Obtaining coverage under the NPDES general construction activity stormwater permit generally requires that the project applicant complete the following steps:

- File a Notice of Intent with RWQCB that describes the proposed construction activity before construction begins

- Prepare a Storm Water Pollution Prevention Plan (SWPPP) that describes Best Management Practices (BMPs) that would be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction.

- File a notice of termination with RWQCB when construction is complete and the construction area has been permanently stabilized.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (Public Resources Code Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The law's main purpose is to prevent the construction of such structures on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "earthquake fault zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and State agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed structures would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code Sections 2690–2699.6) addresses earthquake hazards from nonsurface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. The act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

California Building Standards Code

The State of California provides minimum standards for building design through the California Building Standards Code, or California Building Code (CBC), in Title 24 of the California Code of Regulations. The CBC is based on the Uniform Building Code, which is used widely throughout the United States and has been modified for California conditions with numerous more detailed and/or more stringent requirements.

The California Building Standards Commission coordinates, manages, adopts, and approves building codes in California. In July 2007, the commission adopted and published the 2006 International Building Code as the 2007 CBC. This new code became effective on January 1, 2008, and updated all subsequent codes under Title 24 of the California Code of Regulations.

The State earthquake protection law (California Health and Safety Code, Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum requirements for seismic safety and structural design are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix J of the 2007 CBC regulates grading activities, including drainage, erosion control, and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

California Surface Mining and Reclamation Act of 1975

The California Surface Mining and Reclamation Act (Public Resources Code, Section 2710 et seq.) was enacted in 1975 to regulate activities related to mineral resource extraction. The act requires the office of the State Geologist to classify lands within California based on mineral resource availability. The State Geologist is responsible for classifying lands subject to urban development by Mineral Resource Zones according to the presence or absence of significant sand, gravel, or stone deposits that are suitable as sources of aggregate. The process is based solely on underlying geology without regard to existing land use or land ownership. The primary goal of mineral land classification is to ensure that local government decision-makers recognize and consider the mineral potential of the land before making land use decisions that could preclude mining.

In compliance with the California Surface Mining and Reclamation Act (SMARA), CGS has established the classification system shown in Table 3.6-1 to denote both the location and significance of key extractive resources.

Table 3.6-1
California Division of Mines and Geology Mineral Land Classification System

Classification	Description
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated from existing data
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ zone

Note: MRZ = Mineral Resource Zone
Source: Loyd 1995

Lake Valley State Recreation Area General Plan

In 1988, the State Parks adopted the *Lake Valley State Recreation Area General Plan* (State Parks 1988), which is discussed in Section 3.2, "Land Use." None of the policies contained in that document are applicable to the geology, soils, and land capability and coverage analysis.

Tahoe Regional Planning Agency

1987 Regional Plan

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (*Regional Plan*). TRPA's *Regional Plan*, adopted in 1987, consists of several documents: Goals and Policies, Code of Ordinances, Water Quality Management Plan, Regional Transportation Plan—Air Quality Plan, Plan Area Statements, and Scenic Quality Improvement Plan.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The following TRPA Goals and Policies (TRPA 2004) relate to earth resources and are applicable to this analysis:

LAND USE GOAL 3: All new development shall conform to the coefficients of allowable land coverage as set forth in "The Land Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning, Bailey, 1974." This goal calls for policies which limit allowable impervious land coverage associated with new development. These policies set allowable land coverage by applying the recommended Bailey land coverage coefficients to specifically defined and related areas. In some instances, provisions are made to allow additional coverage by transfer. The transfer programs shall operate by a direct offset method. In addition, land capability is one of the basic factors in determining the suitability of lands for development and appropriateness of land uses.

- **Policy 3:** *Rehabilitation, reconstruction, and upgrading of the existing inventory of structures, or other forms of coverage in the Tahoe Region, are high priorities of the regional plan. To encourage rehabilitation and upgrading of structures, the following policies shall apply:*

  B. Reconstruction, rehabilitation, modification, relocation, or major repair of structures or coverage other than as specified in A above may be allowed, provided such use is allowed under the land use subelement, Goal #2, Policies 8, 9 and 10. For parcels with existing coverage in excess of the Bailey Coefficients, a land coverage mitigation program shall be set by ordinance, which shall provide for the reduction of coverage in an amount proportional to the cost of the repair, reconstruction, relocation, rehabilitation, or modification, and to the extent of excess coverage. To accomplish these reductions, property owners shall have at least the following options:

     i. reducing coverage on-site;

     ii. reducing coverage off-site in a hydrologically-related area;

     iii. paying a rehabilitation fee in lieu of off-site coverage reduction in an amount established by Agency ordinance to help fund a land bank program established to accomplish coverage reductions;

     iv. lot consolidation with a contiguous parcel or lot line adjustment to reduce the percentage of excess coverage on the resulting parcels; or

     v. any combination of the foregoing options.

  C. Existing coverage may be relocated within a parcel provided it is relocated to areas of equal or superior environmental capability consistent with B above.

  D. In establishing the rehabilitation fee schedule(s) provided for in (3.B.iii), above, the following procedures shall be followed: [Policy 3.D. then describes the procedures for establishing the rehabilitation fee schedule.]

  E. In approving repair, reconstruction, rehabilitation, modification, or relocation of structures or other coverage, the Agency shall also apply other relevant standards, including installation of best management practices or compliance with the design review guidelines.

- **Policy 4:** *Land coverage allowed pursuant to redevelopment plans shall be established by TRPA-approved redevelopment plans. However, in no case shall there be a net increase in land coverage in the redevelopment project area.*

NATURAL HAZARDS GOAL 1: *Risks from natural hazards (e.g., flood, fire, avalanche, earthquake) will be minimized.* Land uses within the Tahoe Basin should be cognizant of natural hazards so as to help prevent damage to property and to protect public health. Natural hazard areas or situations can be identified and precautionary measures taken to minimize impacts.

- **Policy 2:** *Prohibit construction, grading, and filling of lands within the 100-year flood plain and in the area of wave run-up except as necessary to implement the goals and policies of the plan. Require all public utilities, transportation facilities, and other necessary public uses located in the 100-year flood plain and area of wave run-up to be constructed or maintained to prevent damage from flooding and to not cause flooding.* The Tahoe Basin is often subject to rain or storm events which cause extreme fluctuations in stream flows or wave run-up which can result in flooding and damage to property. Grading, filling, and structural development within the flood plain causes alteration of the stream flow and may accentuate downstream flooding. Development within the floodplain is subject to damage and inundation as a result of flooding and is generally prohibited by federal regulation (Executive Order No. 11988, 1977 and No. 11296, 1966).

The following goals and policies in Chapter IV (Conservation Element) of TRPA's Goals and Policies (TRPA 2004) related to soil productivity and stream environment zones (SEZ) are applicable to this analysis:

SOILS GOAL 1: *Minimize soil erosion and the loss of soil productivity.* Protection of the Region's soil is important for maintaining soil productivity and vegetative cover and preventing excessive sediment and nutrient transport to the streams and lakes. Soil protection is especially critical in the Basin where the soils are characteristically shallow and highly susceptible to erosion. Strategies for soil conservation are consistent with thresholds established for soil, water, and vegetation.

- **Policy 1:** *Allowable impervious land coverage shall be consistent with the threshold for impervious land coverage.* The Land Use Subelement (see Goal #4) establishes policies which limit impervious land coverage consistent with the impervious land coverage limits set forth in the "Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, a Guide for Planning", Bailey, 1974.

- **Policy 2:** *No new land coverage or other permanent disturbance shall permitted in land capability districts 1–3 except for those uses as noted in A, B and C below:*

  A. Single family dwellings may be permitted in land capability districts 1–3 when reviewed and approved pursuant to the individual parcel evaluation system (IPES). (See Goal #1, Policy 2, Development and Implementation Subelement.)

  B. Public outdoor recreation facilities may be permitted in land capability districts 1–3 if:

     (1) The project is a necessary part of a public agency's long range plans for public outdoor recreation;

     (2) The project is consistent with the recreation element of the Regional Plan;

     (3) The project, by its very nature must be sited in land capability districts 1–3;

     (4) There is no feasible alternative which avoids or reduces the extent of encroachment in land capability districts 1–3;

     (5) The impacts are fully mitigated; and

(6) Land capability districts 1–3 lands are restored in the amount of 1.5 times the area of land capability districts 1–3 which is disturbed or developed beyond that permitted by the Bailey coefficients. To the fullest extent possible, recreation facilities must be sited outside of Land Capability Districts 1–3. However, the six-part test established by the policy allows encroachment of these lands where such encroachment is essential for public outdoor recreation, and precautions are taken to ensure that such lands are protected to the fullest extent possible. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

C. Public service facilities are permissible uses in land capability districts 1–3 if:

(1) The project is necessary for public health, safety or environmental protection;

(2) There is no reasonable alternative, which avoids or reduces the extent of encroachment in land capability districts 1–3;

(3) The impacts are fully mitigated; and

(4) Land capability districts 1–3 lands are restored in the amount of 1.5 times the area of land capability districts 1–3 which is disturbed or developed beyond that permitted by the Bailey coefficients. Development within Land Capability Districts 1–3 is not consistent with the goal to manage high hazard lands for their natural qualities and shall generally be prohibited except under extraordinary circumstances involving public works. Each circumstance shall be evaluated based on the above four-point test of this policy. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

- **Policy 3:** *The land capability map may be reviewed and updated*. TRPA shall provide for a procedure to allow land capability challenges for reclassification of incorrectly mapped areas.

- **Policy 4:** *TRPA shall develop specific policies to limit land disturbance and reduce soil and water quality impacts of disturbed areas.* Like impervious surfaces, disturbed and compacted areas result in increased soil loss and surface runoff. The Regional Plan sets policies designed to reduce existing surface disturbance and avoid new disturbance (see Water Quality Subelement, Goal #1, Policies 2 and 3; Vegetation Subelement, Goal #1, Policy 5). TRPA shall set guidelines defining "disturbance" and determine what types of disturbed and compacted areas should be counted as impervious surfaces for purposes of applying land coverage limits. Coverage limits shall not be applied so as to prevent application of best management practices to existing disturbed areas.

- **Policy 5:** *TRPA shall conduct a survey to identify areas where existing excess coverage is causing environmental damage.* Over a five-year period, TRPA shall survey the streams and watersheds in the Basin to identify areas that show empirical evidence of soil erosion or adverse changes in hydrological conditions as a result of excess coverage. The survey shall propose specific programs to address the problem of excess coverage and may include limits on new coverage, coverage removal, and remedial erosion and runoff control projects.

- **Policy 6:** *Grading, filling, clearing of vegetation (which disturbs soil), or other disturbances of the soil are prohibited during inclement weather and for the resulting period of time when the site is covered with snow or is in a saturated, muddy, or unstable condition. Special regulations and construction techniques will apply to all construction activities occurring between October 15 and May 1.* Impacts related to soil disturbance are highly exaggerated when the soil is wet. For precautionary reasons, all project sites must be adequately winterized by October 15 as a condition for continued work on the site. Exceptions to the grading prohibitions will be permitted in emergency situations where the grading is necessary for reasons of public safety or for erosion control.

- **Policy 7:** *All existing natural functioning SEZs shall be retained as such and disturbed SEZs shall be restored whenever possible.* Stream environment zones (SEZs) shall be managed to perpetuate their various functional roles, especially pertaining to water cleansing and nutrient trapment. This requires enforcement of a non-degradation philosophy. This policy is common to the Water Quality, Vegetation, Stream Environment Zone, and Wildlife Subelements and will be implemented through the Land Use Element and capital improvements program.

STREAM ENVIRONMENT ZONE GOAL 1: *Provide for the long-term preservation and restoration of stream environment zones.* The preservation of SEZs is a means for achieving numerous environmental thresholds. Policies that promote their maintenance, protection, and restoration are listed below.

- **Policy 1:** *Restore all disturbed stream environment zone lands in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been disturbed, developed, or subdivided.* Many acres of SEZ lands have been modified or disturbed. TRPA shall identify the number of acres to be restored and prepare a list of projects to achieve the environmental threshold carrying capacity for stream environment zones. TRPA shall develop an implementation program to restore the necessary acreage, and establish an annual tracking program. The implementation program shall provide for restoration over a twenty year period, with 90 percent of the acreage to be restored within the first fifteen years.

- **Policy 2:** *SEZ lands shall be protected and managed for their natural values.* SEZ lands and associated riparian vegetation are scarce in the Basin relative to other plant communities. Because SEZs provide many beneficial functions (especially pertaining to water quality) only forest management practices, stream improvement programs, and habitat restoration projects are permissible uses.

- **Policy 3:** *Groundwater development in SEZ lands shall be discouraged when such development could possibly impact associated plant communities or instream flows.* Withdrawal of water from SEZ lands may lower surface and ground waters and, by so doing, alter plant composition of the riparian vegetation and reduce instream flows. Groundwater proposals in SEZs and riparian plant communities will be evaluated against those concerns.

- **Policy 4:** *Golf courses in Stream Environment Zones shall be encouraged to retrofit course design in combination with fertilizer application standards (see Water Quality Subelement, Goal #1, Policy 5) to prevent release of nutrients to adjoining ground and surface waters.* A combination of strategies to include fertilizer application standards and course redesign may be necessary to control off-site nutrient release from golf course fairways and greens.

- **Policy 5:** *No new land coverage or other permanent land disturbance shall be permitted in Stream Environment Zones except for those uses as noted in A, B, C, D, and E below:*

  A. Public outdoor recreation facilities are permissible uses in stream environment zones if:

  (1) The project is a necessary part of a public agency's long range plans for public outdoor recreation;

  (2) The project is consistent with the recreation element of the regional plan;

  (3) The project, by its very nature, must be sited in a stream environment zone;

  (4) There is no feasible alternative which would reduce the extent of encroachment in stream environment zones;

(5) The impacts are fully mitigated;

(6) Stream environment zone lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. To the fullest extent possible, recreation facilities must be sited outside of stream environment zones. Some recreation facilities, such as river access points or stream crossings for hiking trails, by their very nature require some encroachment of stream environment zones. However, the six-part test established by this policy allows encroachment of SEZs where such encroachment is essential for public outdoor recreation and precautions are taken to ensure that stream environment zones are protected to the fullest extent possible. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

B. Public service facilities are permissible uses in stream environment zones if:

(1) The project is necessary for public health, safety, or environmental protection;

(2) There is no reasonable alternative, including spans, which avoids or reduces the extent of encroachment in stream environment zones;

(3) The impacts are fully mitigated; and

(4) Stream environment zone lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. Development within stream environment zones is not consistent with the goal of managing stream environment zones for their natural qualities and shall generally be prohibited except under extraordinary circumstances involving public works. Each circumstance shall be evaluated based on the conditions of this policy. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

C. Projects which require access across stream environment zones to otherwise buildable sites are permissible in SEZs if:

(1) There is no reasonable alternative, which avoids or reduces the extent of encroachment in the SEZ;

(2) The impacts are fully mitigated; and

(3) SEZ lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. The restoration requirements can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

D. New development may be permitted in man-modified stream environment zones where:

(1) The area no longer exhibits the characteristics of a stream environment zone;

(2) Further development will not exacerbate the problems caused by development in stream environment zones;

(3) Restoration is infeasible; and

(4) Mitigation is provided to at least partially offset the losses which were caused by modification of the stream environment zones.

E. Stream environment zone restoration projects and erosion control projects.

- **Policy 6:** *Replacement of existing coverage in stream environment zones may be permitted where the project will reduce impacts on stream environment zones and will not impede restoration efforts.* Existing structures in stream environment zones may be repaired or rebuilt. Minor reconstruction may be permitted so long as drainage improvements, protection of the stream environment zone from disturbances, or other measures are carried out which provide a net benefit to the area's capacity to serve as a naturally-functioning stream environment zone. Major reconstruction or replacement may also be permitted if there is a net benefit to the stream environment zone and if the replacement or reconstruction is consistent with stream environment zone restoration programs (see Policy 1).

Code of Ordinances

Section IV (Site Development Provisions) and Section VIII (Grading and Construction Provisions) of the TRPA Code of Ordinances (TRPA 2008) contain the following chapters with requirements applicable to the proposed alternatives related to geology, soils, and land coverage:

- Chapter 20, "Land Coverage Standards," regulates implementation of the land capability system, land capability districts (LCDs), land coverage, and transfer and mitigation of land coverage.

  - Section 20.4 discusses prohibitions on installation of new land coverage or other permanent disturbances within areas assigned to LCDs 1, 2, or 3 (see "Tahoe Regional Planning Agency Land Coverage Regulations" below for a discussion of LCDs). Exceptions to these prohibitions exist for single-family dwellings that are subject to review under the individual parcel evaluation system, qualifying public outdoor recreation facilities, and qualifying public facilities (e.g., water quality control facilities, including erosion control projects; habitat restoration projects; wetland rehabilitation projects; and SEZ restoration projects).

  - Section 20.5 discusses the excess land coverage mitigation program where the amount of land coverage existing prior to the project in the project area exceeds the base land coverage for the project area. Section 20.5.C discusses relocation of existing land coverage where relocation from one portion of a SEZ to another portion is allowed due to a net environmental benefit to the stream environment zone. Net environmental benefit to a SEZ is defined as an improvement in the functioning of the SEZ and includes, but is not limited to: (a) Relocation of coverage from a less disturbed area to a more disturbed area or to an area further away from the stream channel; (b) Retirement of land coverage in the affected SEZ in the amount of 1.5:1 of the amount of land coverage being relocated within a SEZ; or (c) For projects involving the relocation of more than 1000 square feet of land coverage within a SEZ, a finding, based on a report prepared by a qualified professional, that the relocation will improve the functioning of the SEZ and will not negatively affect the quality of existing habitats. Under the later criteria land coverage relocation in the affected SEZ can be a 1:1 ratio (pers. comm. Gustafson 2010).

- Chapter 25, "Best Management Practices Requirements," sets forth the requirements for installation of BMPs for the protection or restoration of water quality and attainment of minimum discharge standards. BMPs, as described in the *Handbook of Best Management Practices* (Volume II of the *Lake Tahoe Basin Water Quality Management Plan*), or equivalent practices approved by TRPA, will be applied to all public and privately owned lands. In addition to the standard requirements of Section 25.5, the project conditions of approval will list any other appropriate required BMPs to meet minimum discharge standards. Construction in SEZs or Land Capability Districts 1–3, inclusive, normally will require special conditions of approval because of the sensitivity of those areas to disturbance.

- Chapter 28, "Natural Hazard Standards," regulates activities to prevent damage to property and protect public health relating to natural hazards.

- Chapter 61, “Special Information Reports and Plans,” regulates the need for special investigations, reports, and plans determined to be necessary by TRPA to protect against adverse effects from grading, including potential effects on slope stability, groundwater or antiquities.

- Chapter 62, “Grading and Construction Schedules,” regulates schedules for grading and construction when those activities are anticipated to occur pursuant to a TRPA permit. Section 62.2 specifies, “For projects presenting special problems with regard to project completion, site development or water quality management, such as crossings of stream environment zones, major earthworks, or major clearing projects, TRPA may require, as a condition of approval, submittal and approval of project schedules prior to site disturbance.”

- Chapter 64, “Grading Standards,” regulates excavation, filling, and clearing to avoid adverse effects related to exposed soils, unstable earthworks, or groundwater interference. Chapter 64 specifically addresses seasonal limitations, winterization techniques, discharge prohibitions, dust control, disposal of materials, standards for cuts and fills, and excavation limitations.

- Chapter 65, “Vegetation Protection during Construction,” regulates the requirements for protection of vegetation and soil during construction activities. Chapter 65 specifically addresses protection of vegetation not designated and approved for removal, limits on size, type, and location of equipment use, and revegetation of disturbed areas.

Tahoe Regional Planning Agency Land Coverage Regulations

Soil conservation is essential for the maintenance of plant communities, prevention of erosion, protection of water quality, maintenance of stream systems, and protection of lake clarity. Soil conservation in the Tahoe Basin is addressed in the context of two key concepts, impervious land coverage and SEZs. Impervious land coverage, such as asphalt, concrete, and roofs, prevents stormwater runoff from absorbing into the ground. When runoff bypasses natural processes of infiltration and migration through soil, it is not filtered by the soil and does not contribute to local groundwater supplies. Excess runoff overloads stream channels, erodes streambanks, and unnecessarily damages vegetation. Stream channel erosion transports nutrients and sediments to Lake Tahoe and contributes to the degradation of water clarity. SEZs are characterized by the presence of water, such as a stream and its banks, as well as marshes, meadows, and wetlands. They provide natural treatment and disperse runoff over large areas, allowing sediment to settle out and vegetation to take up nutrients.

Land Capability Districts

Since 1972, TRPA has used the Bailey System (a land capability classification system) to evaluate applications that request either additional impervious land coverage to existing developed lots or building permits for new development (Bailey 1974). The Bailey System was developed to mitigate the deleterious effects on stream systems and water quality that result from excessive coverage of land by impervious surfaces. The Bailey System restricts the amount of impervious land coverage on all parcels and generally prohibits new land coverage in areas classified as SEZ.

Land capability is defined as “the level of use an area can tolerate without sustaining permanent (environmental) damage through erosion and other causes” (Bailey 1974). The Bailey system uses LCDs ranging from 1 to 7, which assign a percentage of land coverage allowable in the designated LCD area (see Table 3.6-2). Land coverage includes impervious surfaces such as roadways, sidewalks, and structures that prevent precipitation from directly reaching the soil surface.

Table 3.6-2 Capability Districts for Tahoe Basin Lands						
Capability Levels	**Maximum Allowable Coverage (%)**	**Tolerance for Use**	**Slope Percent[1]**	**Relative Erosion Control**	**Runoff Potential[2]**	**Disturbance Hazards**
7	30	Most	0–5	Slight	Low to moderately low	Low-hazard lands
6	30		0–16		Low to moderately low	
5	25		0–16		Moderately high to high	
4	20		9–30	Moderate	Low to moderately low	Moderate-hazard lands
3	5		9–30	Moderate	Moderately high to high	
2	1		30–50	High	Low to moderately low	
1a	1	Least	30+	High	Moderately high to high	High-hazard lands
1b	1		(Poor Natural Drainage)			
1c	1		(Fragile Flora and Fauna)[3]			

[1] Most slopes occur within this range. There may be, however, small areas that fall outside the range given.
[2] Low to moderately low - hydrologic-soil groups A and B; moderately high to high - hydrologic-soil groups C and D.
[3] Areas dominated by rocky and stony land.
Source: Data compiled by EDAW (now AECOM) from Bailey 1974

LCDs were derived by analyzing the land capability according to frequency and magnitude of hazards that might be encountered and by considering the type and intensity of uses suitable for each unit (Bailey 1974). Capability classes are expressed as levels of tolerance that a unit can withstand without sustaining permanent damage through erosion or other causes (i.e., water quality or land productivity). Table 3.6-3 summarizes the characteristics and intensity of uses for LCDs. The integration of the LCDs and land use suitability resulted in limits on land-surface modifications for each unit. The limits are expressed as a percentage of each area that can be used for impervious coverage.

Table 3.6-3 Characteristics of Lands According to Capability Class and Suitable Uses Based on Relative Tolerance Levels		
Capability Level (Class)	**General Characteristics**	**Intensity of Uses**
Low-hazard lands—Classes 5–7	Gently sloping foothills and plains with deep soils. Surface erosion and drainage problems are generally minor to moderate.	Generally suited for various development activities and concentrated public occupancy. Access should be by high-standard roads and trails. May support most kinds of intensive or mass recreational uses. Facilities include campgrounds, recreational residences, hotels, and resorts or other commercial services where these uses would not destroy other values.
Moderate-hazard lands—Classes 3 and 4	Moderately steep mountain slopes. These lands may provide visual backdrops for low-hazard areas.	Recreation use may be varied and concentrated, including campgrounds, picnic areas, and winter sports sites. Access should be by low-standard roads and trails. Low-density housing may be permitted in some circumstances. Limited timber harvest may be appropriate.

Table 3.6-3 Characteristics of Lands According to Capability Class and Suitable Uses Based on Relative Tolerance Levels		
Capability Level (Class)	General Characteristics	Intensity of Uses
High-hazard lands—Class 2	Steep slopes and a fragile environment with unique plants and animals. High scenic value. Little or no soil mantle. Generally occurs in scattered areas at the base of steep slopes and along entrenched stream valleys.	Generally suited for limited recreation, restricted grazing, and selective timber harvest because of erosion hazard on slopes greater than 30 percent. These lands should generally remain in their natural condition. Access facilities should be restricted to foot and horse trails. Dispersed recreational uses could include hiking, backcountry camping, and fishing. These lands should not be managed for intensive commercial uses.
High-hazard lands—Class 1	Mountaintops with little or no soil mantle, and very steep slopes with shallow soils. Subclasses (i.e., 1a, 1b, 1c) refer to marshes, stream channels, SEZs, floodplains, meadows, and beaches.	Some of the uses specified under Class 2 apply to Class 1 as well. However, Class 1 areas are not suited for development, grazing, or forestry uses. Areas identified as Class 1 provide valuable wildlife habitat and are suited for low-intensity recreational uses. Protection of water supplies and watershed values is desirable.
Source: Data compiled by EDAW (now AECOM) from Bailey 1974		

Chapter 2 of the TRPA Code of Ordinances defines land coverage as a human-made structure, improvement, or covering that prevents normal precipitation from directly reaching the surface of the land underlying the structure, improvement, or covering (TRPA 2008). Examples include roofs, decks, patios, and surfaces paved with asphalt, concrete, or stone. Such structures are defined as “hard coverage.” Areas of compacted soils without structures are defined as “soft coverage” (e.g., areas where parking of cars or heavy pedestrian traffic have compacted soils to an extent that prevents substantial infiltration of water).

Plan Area Statements

Each PAS outlines land use classifications, special policies, planning considerations, permissible uses, and maximum allowances for a portion of the Tahoe Basin. The study area is located in PAS 119 (Country Club Meadow), which is designated as an outdoor recreation and natural resource area with opportunities for SEZ restoration (TRPA 2005b:1). PAS 119 planning considerations include a statement that the riverbanks are locally unstable and that log jams are contributing to streambank erosion. The following special policies are relevant to geology for this particular PAS (TRPA 2005b:2):

- Whenever possible, opportunities for restoration of disturbed SEZs and land coverage removal should be encouraged, including strategies to mitigate the impacts of the golf course.

- Erosion control, runoff control, and SEZ restoration are all permissible uses under resource management of PAS 119.

Environmental Threshold Carrying Capacities

TRPA thresholds are standards or environmental quality targets to be achieved in the Tahoe Basin. TRPA cannot approve projects that would cause a significant adverse effect on a threshold. The thresholds discussed below were adopted by TRPA in 2002. Every 5 years TRPA conducts a comprehensive evaluation of whether thresholds are being achieved, maintained, or both; makes specific recommendations to address problem areas; and directs general planning efforts for the next 5-year period. The results of the most recent evaluation were released in 2007 (TRPA 2007b).

To evaluate soil conservation in the Tahoe Basin, TRPA applies two thresholds related to limiting impervious coverage and preserving SEZs:

- **SC-1 Impervious Coverage.** This threshold has two components. The first is based on controlling the amount of new impervious coverage, and the second involves a continuing effort to bring all land coverage into compliance with Bailey System coefficients (see Table 3.6-3).

- **SC-2 Naturally Functioning SEZ.** This threshold also has two components. The first relates to preservation of existing naturally functioning SEZ areas, and the second addresses restoration of disturbed SEZ areas.

The Tahoe Basin's status in 2006 was nonattainment for both SC-1 and SC-2; however, the 2006 Threshold Evaluations Report states, "There has been significant progress and an upward trend in the area of Soil Conservation" (TRPA 2007b:9). The report indicates that the key cause for the nonattainment determination for SC-1 is unmitigated excess coverage associated with pre-1987 development (i.e., development that occurred before adoption of the 1987 Regional Plan). New projects must comply with TRPA's land capability classification requirements, thus SC-1 may be better described as being in "partial attainment" (TRPA 2007b:9).

El Dorado County

Chapter 15.14 of the El Dorado County Code (2007), Grading, Erosion, and Sediment Control Ordinance, was enacted to accomplish all of the following:

- regulate grading within the unincorporated area of El Dorado County to safeguard life, limb, health, property, and public welfare;

- avoid pollution of watercourses; and

- ensure that the intended use of a graded site is consistent with the *El Dorado County General Plan* (El Dorado County 2004), any applicable specific plans, the adopted stormwater management plan, California Fire Safe Standards, and applicable El Dorado County ordinances, including the Zoning Ordinance (Title 17, El Dorado County Code), and applicable chapters of the CBC.

This ordinance establishes the administrative procedures for issuance of permits and provides for approval of plans and inspection of grading construction. The exemptions listed in Section 15.14.140 are not applicable in the Tahoe Basin. All other provisions defined in the ordinance apply. When conflicts with Federal, State, or local laws and regulations occur, the most restrictive are to apply."

ENVIRONMENTAL SETTING

Geology

The Tahoe Basin is located in the northern Sierra Nevada, between the Sierra crest to the west and the Carson Range to the east. The Sierra Nevada is the most prominent mountain range in California, and in conjunction with the Central Basin, forms part of the Sierra Nevada microplate, an element of the broad Pacific–North American plate boundary (Argus and Gordon 1991). Before becoming part of the transform plate margin, the Sierra Nevada was the site of a Cenozoic volcanic arc, with related deposits draping over pre-Cenozoic metamorphic and plutonic rocks (Wakabayashi and Sawyer 2000:173). The general asymmetry of the Sierra Nevada reflects uplift and gentle westward tilting, evidenced by the mountain range sloping gently westward and abruptly eastward from its crest to west of the study area.

The Tahoe Basin was formed more than 2 million years ago by a combination of faulting and volcanism. As a result, the basin contains a combination of granitic, metamorphic, and volcanic rock. The predominant bedrock in the basin is Cretaceous granodiorite of the Sierra Nevada batholith. Cretaceous rock formed during the later period of the Mesozoic Era, characterized by the development of flowering plants and ending with the sudden extinction of dinosaurs and many other forms of life. Pre-Cretaceous metamorphic rocks are found in localized areas. Over the past 1.5 million years, the Tahoe region has been altered by glacial activity. During this activity, valley glaciers dammed the Truckee River Canyon, raising the water level of Lake Tahoe. Lacustrine sediments were deposited in the bays and canyons around the lake as a result of the rising lake levels. The faulting, folding, and in some cases overturning of rock formations that have taken place during various periods of geologic activity, in combination with erosion, deposition, and subsequent cementation of rock materials that have occurred during relatively quiet periods, have left a complex arrangement of geologic rock types and structures in the area. However, the extraordinary clarity of Lake Tahoe is related to the prevalence of resistant granitic bedrock in the Tahoe Basin and an unusually small drainage basin relative to the size of the lake.

Exhibit 3.6-1 indicates that most of the northern portion of the study area is located within an area of Holocene-age (10,000 years ago to present) floodplain deposits composed of gravelly to silty sand and sandy to clayey silt (Saucedo 2005). Approximately one-third of the study area, primarily within the most southern and western areas, is made up of unconsolidated bouldery till.

The study area is located on the U.S. Geological Survey Emerald Bay and Echo Lake, California, 7.5-minute quadrangle maps. The study area is located in a relatively flat area; elevations range from approximately 6,300 to 6,460 feet above mean sea level.

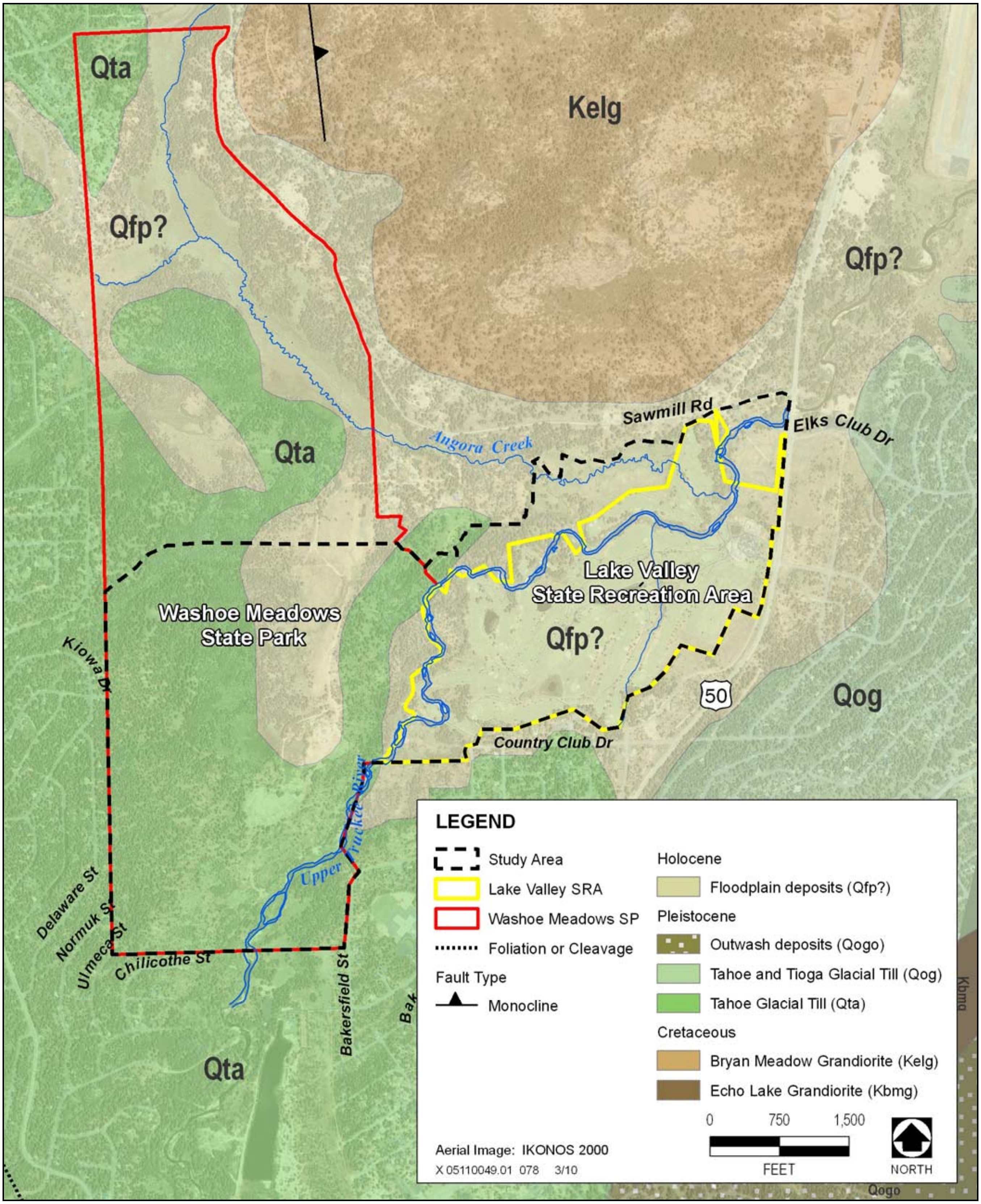
Seismicity

The study area is located approximately 5 miles south of the southern shore of Lake Tahoe within a regionally significant downfaulted graben (i.e., trench-like geologic feature), sometimes referred to as a half-graben. The study area is in Uniform Building Code Seismic Zone 3. It is not located near any active faults, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the California Department of Conservation, Division of Mines and Geology (now California Geological Survey) (Hart and Bryant 1999). However, the Geologic Map of the Lake Tahoe Basin, California and Nevada (Saucedo 2005) shows that several unnamed faults mapped near the study area.

The North Tahoe Fault, located beneath the lake, is a northeast-southwest trending fault, approximately 7.0 miles long. The northeast-southwest trending Incline Village Fault zone appears to be the landward extension of the submerged North Tahoe Fault and also trends northeast toward the Truckee Meadows Fault. All three of these faults may be part of a system of normal faults that rupture together. Evidence indicates that an earthquake may have occurred along the Incline Village Fault as recently as 500 years ago, and all three faults are estimated to be capable of generating an earthquake of magnitude 7.0 (Seitz and Kent 2004).

The East Tahoe Fault, much of which is also located under Lake Tahoe, is inferred along the east margin of the basin (Sawyer 1999). The fault shows bedding terminating against a planar west-dipping bedrock surface, suggesting young movement. Recent bathymetry of Lake Tahoe reveals that the escarpment is deeply dissected, has an irregular base, and is partly buried at the base by well-developed sediment aprons. The subaqueous fault has probably been modified by the deposition of thick debris avalanche deposits, appearing to have accumulated against the eastern basin escarpment after one or more very large debris avalanches that initiated on the west wall of the basin. Schweickert et al. (1999:A-93) speculated that at least one megalandslide on the west side of the basin was triggered by a Holocene faulting event. No evidence has been reported that the East Tahoe Fault displaces Quaternary deposits on the north or south shores of the lake.

The north-south trending West Tahoe–Dollar Point Fault zone is another prominent normal slip fault zone in the Tahoe Basin (Ichinose et al. 1999). The West Tahoe Fault is submerged from Emerald Bay to McKinney Bay. The Dollar Point Fault is the northern continuation of the West Tahoe Fault northward from McKinney Bay. According to the Earthquake Potential Map for Portions of Eastern California and Western Nevada, the Tahoe



Source: Data adapted by EDAW (now AECOM) 2009

Geologic Unit in the Study Area **Exhibit 3.6-1**

area is considered to have a relatively low to moderate potential for shaking caused by seismic-related activity (CGS 2005). Estimates of the peak ground acceleration have been made for the Basin based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. The California Geological Survey has estimated the expected peak horizontal acceleration (with a ten percent chance of being exceeded in the next 50 years) generated by any of the seismic sources potentially affecting the study area as 0.275. (CGS 2003). The Nevada Seismological Laboratory catalog lists eight earthquakes with Richter magnitudes (M) of 4.2 or greater that have occurred since 1950, within approximately 18 miles of the center of Lake Tahoe. These include an M 4.5 earthquake (at Tahoe Vista, approximately 40 miles northwest of the study area) on June 3, 2004. The 2004 event has been attributed to an increase in upper crustal seismicity following a deep dike swarm of 1,611 earthquakes in the Tahoe Vista area, at the site of a deep magma injection event beneath Lake Tahoe (Smith et al. 2004:1278).

Glaciation

The glacial history of the Upper Truckee River watershed was reviewed by SH+G (2004) and River Run Consulting (2006). Tioga glaciers (about 18-26k years before present [ybp]) do not appear to have progressed further downslope than Meyers. However, Tahoe moraines (60-90k ybp) are mapped on the west edge of the project area, and pre-Wisconsin (Donner Lake, 400-600k ybp) moraines are found to the east. Much of the valley floor through the project area is composed of outwash and reworked till from these glaciations and subsequent entrenchment and fluvial reworking during interglacials. Much of the sediment available locally to the modern river is found in outwash terraces, particularly in the reach upstream of the study area and in the upper third of the study area.

Changing lake levels throughout the Pleistocene and early Holocene have also strongly influenced sedimentology of the valley flat along the lower river. Based on the elevation of Donner Lake till in the Truckee River canyon downstream of Lake Tahoe, Birkeland (1963) suggest that the lake may have been impounded by ice during this time to an elevation of about 6,840 feet, a rise of 600 feet, about the current elevation of Page Meadow. Evidence for this high lakestand includes a prominent bench at about elevation 6,800 feet throughout the Lake Tahoe basin, though Birkeland (1963) notes that lakestands at this elevation may have been due to volcanic flows. He also notes that deltaic sands and gravels just north of Ward Creek at an elevation of 6,440, near the top of the Ward Creek alluvial fan, are pre-Wisconsin in age and may be Donner Lake.

Birkeland (1963) also suggests that Tahoe glaciation tills in the Truckee River canyon are evidence for lakestands up to 6,440 feet, or about 210 feet above current lake level. However, there is no evidence for a lakestand at this elevation in the Lake Tahoe basin, although there are several terraces around the lake at 6,320 feet, or about 90 feet above current lake level. Birkeland (1963) concludes that if the higher lakestands occurred during the Tahoe glaciation, they did not persist for long periods, and that the evidence supports maximum lake levels of around 90 feet. There is also a prominent 40-foot (elevation 6,280 feet) high terrace in several locations around Lake Tahoe, and Birkeland attributes this to Tahoe glaciation high lakestands as well. He notes that evidence of Tioga glacial advances in the Truckee River canyon suggests that ice may have caused local damming, but was unlikely to have substantially raised the surface of Lake Tahoe. It is important to note that the high lakestands produced by glacial damming would have been relatively ephemeral; because ice is lighter than water, glacial dams tend to fail as the lake behind them fills. The resulting floods, termed jokulhlaups, often are of extremely high magnitude.

Within the project area, the lower portion is mapped as lacustrine deposits, grading into Tahoe morainal deposits at the upstream end. The upstream end of the project area is near the upper end of Tahoe stage high lakestands. There was likely a delta in this area in Tahoe times, with coarser outwash deposits grading into fine-grained lacustrine deposits. Tioga and recent floodplain processes have reworked these deposits. Upstream of the Tahoe delta, the more recent fluvial processes have entrenched within the older Tahoe outwash, resulting in the modern floodplain entrenched within Tahoe and Tioga outwash terraces. A distinct transition occurs near the upstream end of the project area, downstream of which well-bedded, sorted and compact Tahoe age lacustrine deposits are the primary unit. Similar to reaches above the project area, Tioga and recent fluvial reworking of these deposits has occurred, but the underlying Tahoe deposits are of a different character. The study area is at the transition between the narrower outwash confined valley typical of upstream areas and wider valley and floodplain areas influenced by back water during high lake stands. These glacial deposits influence channel form and function. The study area can be divided into three reaches: upstream outwash reach, middle transition reach, and downstream meadow reach. The upstream reach has coarser bank and bed materials and narrower floodplain. It transitions to the broader meadow valley downstream.

The lacustrine deposits strongly influence channel form and function within the lower half of the study area in the meadow reach. In many locations, resistant outcrops on the streambed influence channel gradient. Simon et al. (2003) noted that these resistant outcrops, likely lacustrine from high lake level stands, also influence patterns of streambank erosion. Mussetter Engineering (2000) suggests that resistant lacustrine deposits have limited widening subsequent to incision.

Another transition through deltaic deposits associated with lower lake stands occurs downstream of the study area, from the U.S. 50 (Elks Club) crossing downstream to the upper end of the Lake Tahoe airport. From this area downstream, broad meadows are primarily mapped as lake deposits. Mussetter Engineering (2000) notes that lacustrine deposits in the meadow just upstream of the lower U.S. 50 (City of South Lake Tahoe) crossing are relatively young.

Minerals

Under SMARA, the State Mining and Geology Board may designate certain mineral deposits as being regionally significant to satisfy future needs. The board’s decision to designate an area is based on a classification report prepared by CDMG and on input from agencies and the public. The study area is underlain by silt, silty sand, sandy to clayey silt, sand and gravel, and artificial fill of varying composition. It lies within the designated MRZ-1 for gold deposits formed by mechanical concentrations (placer deposits) (CGS 2001:Plate 7); MRZ-1 (v) for deposits formed by volcanogenic processes (CGS 2001:Plate 6); MRZ-4 (s) for gold deposits formed by contact (CGS 2001:Plate 8). Plates 2 and 4 (CGS 2001) identify a historic sand and gravel site #572 (stone), Anderson Quarry as being located within the SRA golf course meadow. However, the quarry site is actually located on the west side of the Upper Truckee within the SP, within the area proposed as golf course under Alternative 2.

While the exact dates of use are unknown the quarry site is visibly active in a 1969 aerial photograph of the study area. Quarrying was discontinued before parks purchase in 1985. It consists of 3 contiguous lobes, trending NNE, totaling approximately 17 acres. The middle lobe was the deepest, with the back headwall approximately 30 feet tall. This lobe was filled with material from Lower Westside Restoration project in 2001, and revegetated using compost to recreate a soil layer and native seed in 2002. The headwall of northern lobe intercepts the water table from a fen located upslope creating a man made wetlands type environment on the former quarry floor. The topography and vegetation have not been restored, but the seepage does support the artificial wetland. The southern lobe is the shallowest, and a ditch was dug to drain it toward the northeast. The ditch has since headcut and gullied. Both the north and south pits have asphalt and brick waste within them dating from the time of mining the quarry.

Soils

Soil profile formation within the study area is a result of the interplay of geomorphic and hydrologic processes, vegetation, and in situ chemical processes. General trends are described below.

Although the Upper Truckee River has reduced overbank frequency and inundation because of channel deepening and widening that has reduced connectivity with the floodplain under existing conditions, some overbanking and floodplain sedimentation does occur during less frequent flow events (>5-10 year). However, the sediment retention rates represent a very small percentage of the recent sediment load being supplied via streams and surface runoff, and substantial loads of suspended sediment continue to be delivered downstream and to Lake Tahoe.

The following descriptions are qualitative summaries of soil types based on the *Soil Survey for the Lake Tahoe Basin Area* (NRCS 2007):

- **Pits and dumps (Map Unit 7031)**—This soil type consists of pits and dumps with minor Arents and Xerorthents. It is not subject to flooding or ponding. There are no ratings for wind erosion, excavations, roads, or dwellings.

- **Tahoe complex, 0 to 5 percent slopes gravelly (Map Unit 7042)**—This soil type is located in riparian corridors all around the Tahoe Basin within floodplains and valley flats. The soils are derived from granitic and volcanic parent material. Soils consist of mucky gravelly silt loam, gravelly loam, gravelly loamy fine sand, and gravelly fine sand. The soil has moderate permeability, is naturally poorly drained, and is occasionally subject to flooding. The soil has a low shrink-swell potential (nonexpansive) and has a very high runoff potential. Wind erosion hazard is high. There are limitations on excavations, road construction, and dwellings.

- **Watah peat, 0 to 2 percent slopes (Map Unit 7071)**—This soil type is located in the southern part of the Tahoe Basin in fens, floodplains, and valley flats. Soils are derived from an organic layer over an alluvium. The near surface soils consist of peat and mucky peat to mucky gravelly coarse sandy loam and gravelly loamy coarse sand at the substratum. The soil has moderate permeability and low shrink-swell potential, is very poorly drained, and has very high surface runoff potential. Flooding and ponding occur frequently. Wind erosion hazard is high. There are limitations on excavations, road construction, and dwellings.

- **Celio loamy coarse sand, 0 to 5 percent slopes (Map Unit 7431)**—This soil type is located in the southern part of the Tahoe Basin within outwash terraces. Soils are derived from an alluvium or outwash granodiorite and consist of loamy coarse sand, gravelly loamy coarse sand, and gravelly loamy coarse sand to extremely gravelly coarse sand and extremely gravelly coarse sand at the substratum. The soil has rapid permeability and low shrink-swell potential, is somewhat poorly drained, and has high surface runoff potential. Flooding is rare and ponding occurs occasionally. The wind erosion hazard is low. There are limitations on excavations, road construction, and dwellings.

- **Gefo gravelly loamy coarse sand, 2 to 9 percent slopes (Map Unit 7451)**—This soil type is located in the southern part of the Tahoe Basin within hillslopes and outwash terraces. The soils are derived from an outwash granodiorite and consist of gravelly loamy coarse sand and gravelly coarse sand. The soil has rapid permeability and low shrink-swell potential, is somewhat excessively drained, and has very low surface runoff potential. Flooding and ponding do not occur. The wind erosion hazard is low. There are limitations on excavations. There are no limitations on road construction and dwellings.

- **Gefo gravelly loamy coarse sand, 9 to 30 percent slopes (Map Unit 7452)**—This soil type is located in the southern part of the Tahoe Basin within hillslopes and outwash terraces. The soils are derived from an outwash granodiorite and consist primarily of gravelly loamy coarse sand. The soil has rapid permeability and low shrink-swell potential, is somewhat excessively drained, and has low surface runoff potential. Flooding and ponding do not occur. The wind erosion hazard is low. There are limitations on excavations and dwellings. There are no limitations on road construction.

- **Jabu coarse sandy loam, 0 to 9 percent slopes (Map Unit 7461)**—This soil type is located in the southern part of the Tahoe Basin within hillslopes and outwash terraces. The soils are derived from a granodiorite outwash and consist of slightly decomposed plant material and coarse sandy loam to gravelly coarse sandy loam, coarse sandy loam, stratified fine sandy loam to silty clay, and coarse sandy loam. The soil has very slow permeability and low shrink-swell potential, is well drained, and has low surface runoff potential. Flooding and ponding do not occur. The wind erosion hazard is low. There are limitations on excavations and road construction. There are no limitations on dwellings.

- **Marla loamy coarse sand, 0 to 5 percent slopes (Map Unit 7471)**—This soil type is located in the southern part of the Tahoe Basin within outwash terraces and valley flats. Soils are derived from alluvium granodiorite. The near-surface soils consist of slightly decomposed plant material, loamy coarse sand, clay loam, stratified sandy loam, and fine sandy loam at the substratum. The soil has slow permeability and low shrink-swell potential, is poorly drained, and has very high surface runoff potential. Flooding is rare; however, ponding does occur. The wind erosion hazard is low. There are limitations on excavations, road construction, and dwellings.

- **Meeks gravelly loamy coarse sand, 5 to 15 percent slopes, stony (Map Unit 7482)**—This soil type is located in the southwestern part of the Tahoe Basin within hillslopes and outwash terraces. Soils are derived from a granodiorite outwash and/or till. The near surface soils consist of slightly decomposed plant material and gravelly loamy coarse sand to extremely stony loamy coarse sand and gravelly loamy coarse sand at the substratum. The soil has slow permeability and low shrink-swell potential, is somewhat excessively drained, and has very low surface runoff potential. Flooding and ponding does not occur. The wind erosion hazard is low. There are limitations on excavations, road construction, and dwellings.

LAND CAPABILITY AND COVERAGE WITHIN THE STUDY AREA

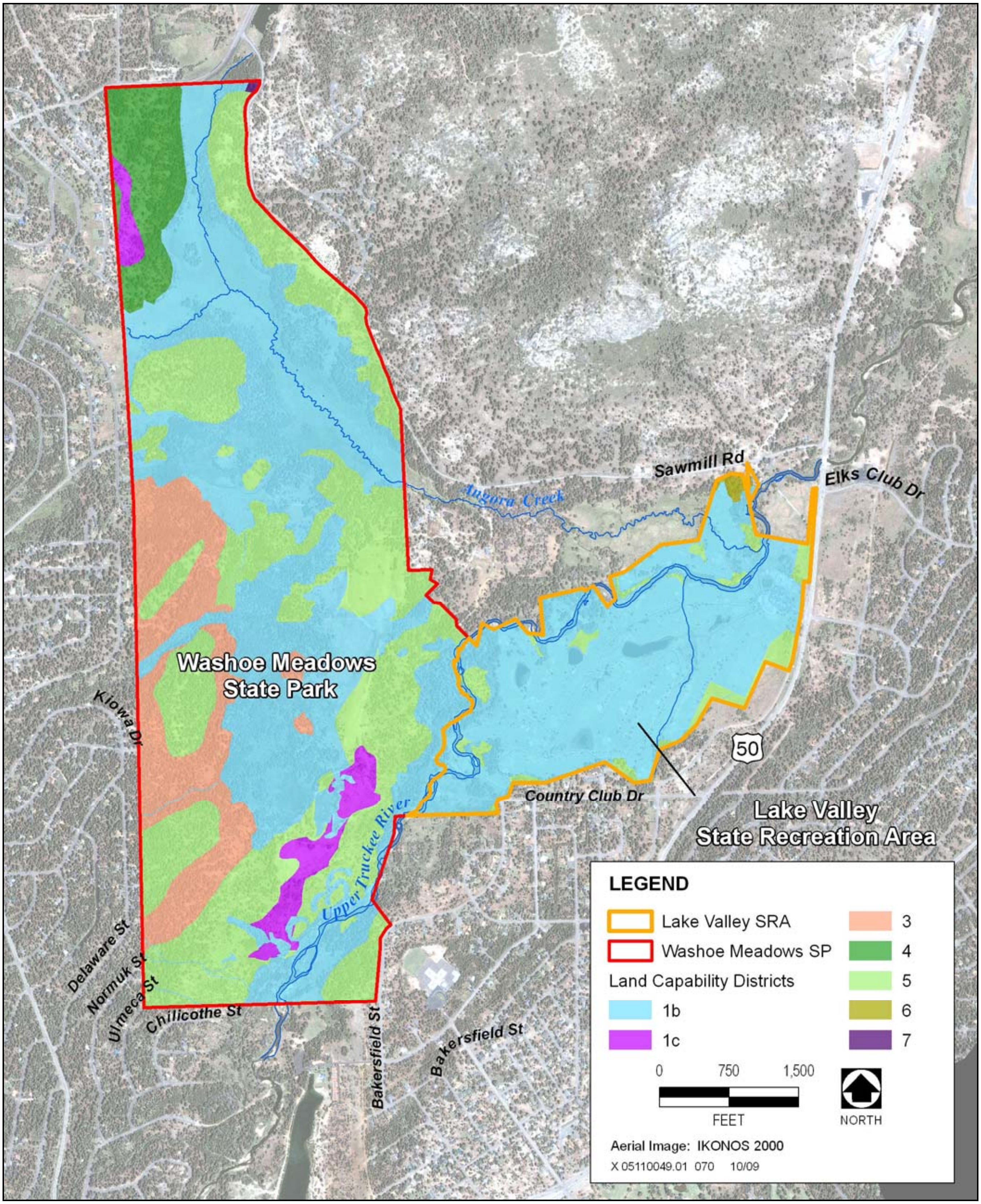
The study area includes LCDs 1b, 1c, 3, 5, and 6 (Exhibit 3.6-2) as verified by TRPA in 2008 (TRPA file number LCAP2008-006). The existing golf course is primarily within LCD 1b with the majority of the higher capability land being located within the southern half of Washoe Meadows SP. Approximately 17 acres of previously disturbed quarry (described above) is LCD 1c.

Coverage within the Lake Tahoe Golf Course consists of the golf cart paths, the parking lot, unpaved parking area and associated club house and maintenance building as well as a small pump house and the golf course bridges. While the golf course landscaping is considered disturbance it is not considered coverage. Coverage within Washoe Meadows SP includes several trails, gravel and dirt service roads, and a barn. The coverage in both units existed prior to acquisition by State Parks. A program has been implemented by State Parks to restore some of the disturbed areas of coverage both in Washoe Meadows SP and Lake Valley SRA and the pre-1972 coverage has been banked as mitigation. Tables 3.6-4 and 3.6-5 contain the distribution of land coverage per land class for both Washoe Meadows SP and Lake Valley SRA. An additional 3,312 square feet of pre-1972 coverage is located within the study area adjacent to Lake Valley SRA on Conservancy property.

Table 3.6-4
Existing Land Area, Land Capability, and Land Coverage Calculations for Washoe Meadows State Park (square feet)

Land Class	Gross Area	TRPA Allowable Base Coverage (%)	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Existing Pre-1972 Coverage	Restored Pre-1972 Coverage	Banked Coverage
1a	–	1	–	–	–	–	–
1b	5,039,839	1	50,398	130,133	126,648	35,983	30,757
1c	539,184	1	5,392	141,582	141,582	174,132	174,132
2	–	1	–	–	–	–	–
3	2,180,496	5	109,025	56,365	53,781	21,766	19,182
4	–	20	–	–	–	–	–
5	5,246,359	25	1,311,590	126,344	124,493	108,848	106,997
6	–	30	–	–	–	–	–
7	–	30	–	–	–	–	–
Totals	**13,005,878**	**–**	**1,476,405**	**454,424**	**446,504**	**340,729**	**331,068**

Source: Data provided by State Parks 2010



Source: Data adapted by EDAW (now AECOM) 2009

Land Capability **Exhibit 3.6-2**

Table 3.6-5 Existing Land Area, Land Capability, and Land Coverage Calculations for Lake Valley State Recreation Area (square feet)							
Land Class	Gross Area	TRPA Allowable Base Coverage (%)	Base Coverage Allowed Per the Bailey System	Existing TRPA Verified Existing Coverage	Existing Pre-1972 Coverage	Restored Pre-1972 Coverage	Banked Coverage
1a	–	1	–	–	–	–	–
1b	8,396,269	1	83,963	286,219	251,536	85,436	33,412
1c	–	1	–	–	–	–	–
2	–	1	–		–	–	
3	–	5	–		–	–	
4	–	20	–		–	–	
5	868,343	25	217,086	13,585	12,747	5,964	5,126
6	75,197	30	22,559		–	–	
7	–	30	–		–	–	
Totals	**9,339,809**	**–**	**323,608**	**299,804**	**264,283**	**91,400**	**38,538**
Source: Data provided by State Parks 2010							

3.6.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, effects on environmental thresholds of the Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, a geology, soils, or mineral resources impact is considered significant if implementation of an alternative would do any of the following:

- expose people or structures to potential substantial adverse effects, including loss or injury from seismic hazards, such as earthquake fault rupture, strong seismic ground shaking, liquefaction, or landslides;
- result in substantial soil erosion or loss of topsoil;
- be located on a geologic unit that is unstable or would become unstable as a result of the project;
- be located on expansive soil;
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available; or

- result in the loss of availability of known mineral resources that would be of future value to the state or the region.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on geology, soils, and land capability and coverage if it would:

- result in a change in the topographic features of the site inconsistent with the natural surrounding conditions;
- change the undisturbed soil or native geologic substructures or grading in excess of 5 feet;
- continue or increase wind or water erosion of soils;
- result in changes in siltation, deposition, or erosion that could modify the channel of a river or stream or the bed of a lake;
- compact or cover soil with impervious surfaces beyond the limits allowed in the land capability districts;
- expose people or property to seismic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards; or
- be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

Impacts related to stream channel erosion are discussed in Section 3.3, "Hydrology and Flooding," and Section 3.4, "Geomorphology and Water Quality."

METHODS AND ASSUMPTIONS

Impacts associated with geology, soils, mineral resources, and land capability and coverage that could result from project construction and operational activities were evaluated qualitatively based on expected construction practices, materials, and locations and the duration of project construction and related activities; relevant site-specific reports; a field visit; the alternatives description in Chapter 2, "Project Alternatives"; and a review of published geologic literature, including maps, books, and journal articles. The impact analysis for earth resources also relies on information and analysis provided in Section 3.3, "Hydrology and Flooding" and Section 3.4, "Geomorphology and Water Quality." As discussed in Section 3.4, "Geomorphology and Water Quality" potential violations of the narrative turbidity standard, while considered a significant impact for CEQA/NEPA/TRPA analysis for the water quality discussion in this document, would not necessarily correspond to an adverse effect on beneficial uses. This is also true for effects on soils. Turbidity levels would also likely need to exceed the minimum aesthetic criterion to have adverse effects on soils. A finding of a significant unavoidable water quality impact does automatically correspond to an adverse condition on soils, because impairment of related beneficial uses would likely require the proposed project to elevate turbidity levels considerably more than 10 percent above background for a larger magnitude and longer duration beyond the limited area and brief period used for the water quality analysis.

The verified TRPA coverage information and the TRPA Land Classification System (Tables 3.5-2 through 3.5-5) and coverage requirements were used to analyze potential impacts on sensitive slope, soils, and drainage conditions. Although coverage is presented separately for Washoe Meadows SP (parklands within the study area) and Lake Valley SRA to show relative changes between these areas, the coverage impacts are addressed as one contiguous area.

The earth resources–related environmental consequences of implementing the proposed alternatives were determined from a comparison with existing conditions, which are also embodied in Alternative 1, the No Project/No Action Alternative. Mitigation is identified for all potential impacts. The proposed mitigation meets CEQA, NEPA, and TRPA requirements by reducing earth resources–related impacts to a less-than-significant level when feasible.

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Expansive Soils - Expansive soils shrink and swell as a result of moisture change. Over time, these volume changes can damage building foundations, underground utilities, and other subsurface facilities and infrastructure if they are not designed and constructed appropriately to resist the changing soil conditions. Volume changes of expansive soils also can result in the consolidation of soft clays following the lowering of the water table or the placement of fill. Placing buildings or constructing infrastructure on or within unstable soils can result in structural failure. Based on a review of NRCS soil survey data discussed above, the entire study area is underlain by soils with low shrink-swell potential, indicating the soils are not expansive as defined in Table 18-1-B of the Uniform Building Code. Because construction would occur on soils with low shrink-swell potential, there would be no risk to life or property related to construction on expansive soils.

Landslide/Mudslide Potential - A landslide or mudslide is the downhill movement of earth material under the force of gravity. The factors contributing to landslide potential are steep slopes, unstable terrain, and proximity to earthquake faults. This process typically involves the surface soil and an upper portion of the underlying bedrock. Subsurface water in slopes can be an important indicator of landslide potential where water may be forced to the surface along impermeable layers. Springs or seeps may result from impermeable layers and near-surface water. Topographic depressions, heavy irrigation, or disrupted surface water channels can cause ponding and increased infiltration of surface water. The presence of shallow subsurface water is an important factor because pore-water pressure reduces the forces resisting landslide movement. Furthermore, expansive soil on slopes tends to shrink and swell in response to moisture content changes, and during this shrinking and swelling process, gravity tends to work the soil downslope. The potential for any of the alternatives to induce large mass movements or to create new mass movement hazards is a direct function of the type and extent of the ground disturbances and topographic alterations that would result from project construction. The study area has a relatively low gradient. There are areas where groundwater seepage does occur along the cut slope within areas proposed for restoration under Alternative 2; however, these areas were extensively disturbed many years prior, during the period when the quarry was active, and they show no indication of unstable slopes that would cause a landslide. Therefore, implementing any of the project alternatives would not cause any potential risk to people and structures associated with landslides.

Avalanche Potential - An avalanche is a rapid flow of snow down a slope, from either natural triggers or human activity, typically occurring in mountainous terrain. For a slope to generate an avalanche, it must be simultaneously capable of retaining snow and allowing snow to accelerate after it is set in motion. The angle of the slope that can hold snow depends on the ductile and shear strength of the snow, which is determined by the temperature and moisture content of the snow. The study area is located in a relatively flat glacial valley where the potential for avalanche is extremely low. Therefore, implementing any of the project alternatives would have no effect on life and property related to avalanches.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.6-1 (Alt. 1)	Soil Erosion, Sedimentation and Loss of Topsoil. *Under Alternative 1, no restoration would occur, formerly disturbed areas (i.e., trails, roads, and streambanks) would continue to erode, and on-site construction equipment would continue to be operated as it is today (i.e., for fuels management and lawn mowing); thus, soil erosion would remain comparable to the current conditions. This impact would be* ***less than significant.***

Under Alternative 1, formerly disturbed areas (i.e., trails, roads, and streambanks) would continue to erode, and on-site equipment would continue to be operated as it is today (i.e., for fuels management and lawn mowing); thus, soil erosion would remain comparable to the current conditions. Repairs would be completed, as necessary, to stabilize streambanks and/or infrastructure, but this potential for emergency maintenance would be the same as current conditions. Repairs, under this alternative, would be localized stabilization treatments designed to slow erosion and protect infrastructure, but would not restore natural channel morphology or function. The nature and extent of these unforeseeable activities are unknown and would not be a direct result of implementing Alternative 1. This impact would be less than significant.

No mitigation is required.

IMPACT 3.6-2 (Alt. 1)	Risks to People and Structures Caused by Strong Seismic Ground Shaking. *Fault activity in the project vicinity could subject people and existing structures in the study area to damage or other risks associated with strong seismic ground shaking; however, Alternative 1 would not modify existing facilities and because risks of earth shaking activity is relatively low this impact would be* ***less than significant****.*

Implementation of Alternative 1 does not include construction of any new buildings or other structures. The potential for earth shaking activity to occur is low to moderate according to probabilistic modeling for the area; however, if seismic ground shaking were to occur it could potentially affect existing structures and people within the study area. Because Alternative 1 would not modify existing facilities and the potential for earth shaking activity is relatively low, this impact is less than significant.

No mitigation is required.

IMPACT 3.6-3 (Alt. 1)	Land Coverage Changes. *Coverage within the study area would not be modified under Alternative 1. Existing coverage associated with golf course uses would continue to be located adjacent to the Upper Truckee river and Angora Creek, as well as throughout the SRA. Because existing land uses within Washoe Meadows SP and Lake Valley SRA and associated coverage would continue this impact is* ***less than significant****.*

Coverage within the study area would not be modified under Alternative 1. Existing coverage for Washoe Meadows SP and Lake Valley SRA under Alternative 1 is presented in Tables 3.6-6 and 3.6-7. Existing coverage associated with golf course uses would continue to be located adjacent to the Upper Truckee River and Angora Creek, as well as throughout the SRA. Coverage associated with existing access roads, volunteer trails and the former quarry site would also continue. Coverage allowed is based on TRPA allowable base coverage or the pre-1972 “grandfathered” coverage, whichever is greater. Coverage allowed within 1b in the study area (both units) is 480,521 sf. Under Alternative 1, 416,353 sf of existing coverage with in LCD 1b would continue to be used, including cart paths, bridges, trails, and other existing coverage that would not be modified. Coverage allowed within LCD 1c in the study area is 315,714 sf. Under Alternative 1, 141,582 sf of coverage within LCD 1c, including existing trails and roads, as well as other existing coverage that would not be modified. Coverage allowed within LCD 3 in the study area is 109,025 sf. Under Alternative 1, 56,365 sf of existing trail coverage will continue to be used in LCD 3. Coverage allowed within LCD 5 in the study area is 1,528,676 sf. Under Alternative 1, 122,430 sf of coverage with in LCD 5, including cart paths and designated trails, as well as other existing coverage that would not be modified. Coverage allowed within LCD 6 in the study area is 22,559 sf; no coverage is located within LCD 6. There are no areas within the study area classified as LCD 1a or 7.

Table 3.6-6
Alternative 1 Coverage Impacts Summary for Washoe Meadows State Park (square feet)

Land Class	Gross Area[1]	Hard/ Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–
1b	5,039,839	1,122/129,011	50,398	30,757	NR	NI
1c	539,184	0/141,582	5,392	174,132	–	NI
2	–	–	–	–	–	–
3	2,180,496	0/56,365	109,025	19,182	–	NI
4	–	–	–	–	–	–
5	5,246,359	0/108,844	1,311,590	106,997	NR	NI
6	–	–	–	–	–	–
7	–	–	–	–	–	–
Total	**13,005,878**	**0/435,802**	**1,476,405**	**331,068**	**NR**	**NI**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA located within the study area.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Table 3.6-7
Alternative 1 Coverage Impacts Summary for Lake Valley State Recreation Area (square feet)

Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–
1b	8,396,269	269,866/16,354	83,963	33,412	NR	NI
1c[2]	–	–	–	–	–	–
2	–	–	–		–	–
3	–	–	–		–	–
4	–	–	–		–	–
5	868,343	10,143/3,443	217,086	5,126	NR	NI
6	75,197	–	22,559		–	–
7	–	–	–		–	–
Total	**9,339,809**	**280,009/19,797**	**323,608**	**38,538**	**NR**	**NI**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA within the study area.
[2]Coverage estimate does not include 3,312 sf of existing pre-1972 golf course related coverage located on Conservancy property.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Under Alternative 1, no changes to Lake Valley SRA or Washoe Meadows SP would occur. State Parks may continue to restore and bank existing coverage, but those changes would not be a component of Alternative 1. Because existing land uses and associated coverage would continue this impact is less than significant.

No mitigation is required.

IMPACT 3.6-4 (Alt. 1) **Result in Loss of Availability of Known Mineral Resources**. *Alternative 1 would not include any changes to existing conditions, including the former gravel and sand quarry located within Washoe Meadows SP. Therefore, this impact would be* ***less than significant.***

Alternative 1 would not include any changes to existing conditions, including the former gravel and sand quarry located within Washoe Meadows SP. The quarry has not been in use since before State Parks acquired the property in 1985 and currently has a limited viable resource. Furthermore, the central lobe of the quarry has been restored with fill material, compost, and native seed to match the natural surroundings. Therefore, this impact would be less than significant**.**

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.6-1 (Alt. 2) **Soil Erosion, Sedimentation, and Loss of Topsoil.** *The topography, soils, vegetation, and drainage within Washoe Meadows SP would be modified under Alternative 2 by incorporating disturbed areas into the reconfigured golf course, offsetting the existing erosion caused by prior surface disturbances. Undersized bridges and golf course uses adjacent to the Upper Truckee River and Angora Creek within the SRA would be removed. Conditions related to erosion, sedimentation, and loss of top soil would be improved; however, project-related construction, grading, and stockpile storage associated with implementation of Alternative 2 would result in exposure of soil to potential wind and water erosion until the project site is effectively stabilized and revegetated. This impact would be* ***potentially significant****.*

The existing disturbed former quarry and some of the unpaved access roads, informal trails, and other disturbed surfaces that have accelerated soil erosion within Washoe Meadows SP would be modified under Alternative 2. The reconfigured golf course would be designed so that it takes advantage of the existing topography to limit grading; however grading would be in excess of 5 feet in some locations within the project area. The natural drainages would be considered and incorporated within planned stormwater drainage improvements, and erosive areas that were previously disturbed within the proposed golf course footprint would be revegetated. Permanent BMP design details are not yet known; however, existing BMPs would continue or be improved upon in the final design. Alternative 2 includes improved irrigation water management, use of stormwater ponds, sediment management, good subsurface drainage routing, regulated runoff impoundments, and use of land absorption areas. Therefore, implementing Alternative 2 is expected to have a beneficial effect on surface erosion by restoring some areas that are actively eroding or are compacted and limiting infiltration under the existing conditions. However, because design details and their performance standards are not yet known, this impact is potentially significant.

Implementing Alternative 2 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb areas in uplands (west of the river), as well as in the active and 100-year floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek. The extent of in-channel work would vary by year (see Alternative 2 construction schedule section in Table 2-4). Bridge removals, the new bridge installation, grade controls, bank protection measures, and transition connections between channel segments would require work in the active channel. The reconnected meanders and newly constructed meanders, as well as portions of the floodplain reconstruction, existing golf course reconfiguration, and new golf course construction, would be completed outside of the existing active channel. Nearly all of the disturbance areas, access routes, and staging areas (except the driving range) proposed north and/or east of the Upper Truckee River would be within the 100-

year floodplain. Most of the disturbance areas, access routes, and staging locations proposed west of the Upper Truckee River would be outside the 100-year floodplain (see Exhibit 2-7).

Although implementing Alternative 2 would involve salvaging, reusing, and protecting on-site resources (e.g., willows, sod, trees) where possible, exact details have not yet been determined. The design is expected to minimize vegetation removal, which would assist in decreasing potential erosion, but extensive tree removal is proposed within the golf course reconfiguration footprint. Within this area and the new channel sections, it can be expected that salvageable topsoil would be removed and reused on-site where grading exceeds the depth of topsoil, minimizing the loss of topsoil and the need to import topsoil into the study area.

Permits and approvals from several entities (e.g., El Dorado County, TRPA, Lahontan RWQCB, USACE, and CDFG) that would impose conditions and requirements to minimize construction phase risks of water quality degradation by sediment or other pollutants would need to be obtained. Although the general types of permit documents and their components are known, the specific measures, performance standards, and enforcement elements would not be established until the time of acquisition. Several general construction management measures would be implemented to minimize environmental impacts, along with specific measures to control wind- and water-related erosion and to protect water quality related beneficial uses (see Chapter 2, “Project Alternatives”). Exact erosion control measures (BMPs) or their performance standards are not specified at this time, but general BMPs would include use of construction fencing, silt fences, hay bales, temporary settling basins, vegetation protection, hydroseeding, and straw mulch. Construction activities that require access to the existing streambed or streambanks would require temporary dewatering of surface water in the river channel, and, where subsurface access is needed, temporary dewatering/pumping of groundwater that seeps into the work area may also be required. Conceptual approaches to dewatering have been identified for various elements of Alternative 2 in-channel work, but specific measures have not yet been determined.

Although efforts would be made to work as quickly as possible to move from initial disturbance through final revegetation throughout the study area, it is expected that disturbed areas would be exposed to winter conditions between summer construction seasons. Winterization protection could be needed throughout the construction zone, and possible overwinter use of staging, storage, or access areas has not yet been determined. All temporary stormwater controls and/or overwinter flood flow protections would likely be designed and sized to meet typical regulatory requirements (e.g., 20-year rainstorm for stormwater; 50-year peak streamflow) but could be overwhelmed by larger event if it occurred during the construction period. However, the probability of an event of greater magnitude occurring during either the summer low-flow seasons or the couple of intervening winters is very low and would not be reasonably foreseeable.

Based on the conceptual information regarding proposed construction management for Alternative 2, it remains possible that erosion, sedimentation, and loss of topsoil could occur. This impact would be potentially significant.

Mitigation Measure 3.6-1A (Alt. 2): Prepare and Implement Effective Site Management Plans.

This mitigation measure is similar to Mitigation Measure 3.4-6. The project is expected to be required to develop and implement several construction phase site management plans as part of various permit and approval requirements, including but not limited to a grading and erosion control plan, a dewatering and channel seasoning plan, a winterization plan, and a monitoring and oversight plan. The following measures will be implemented by State Parks within each of these plans to be developed for specific permits or as independent mitigation measures;

- Restrict the area and duration of construction disturbance to the absolute minimum necessary to accomplish work.

- Protect existing vegetation outside construction area and salvage and re-use riparian or plant new vegetation in disturbed areas.

- Design, install, and maintain temporary BMPs to protect disturbed areas and minimize soil erosion, prevent surface runoff interaction with disturbed surfaces, and limit the potential for release of sediment to surface water bodies for storm events up to the 20-year precipitation event.

- Design, install, and maintain internally draining construction area(s) on either side of each of the Upper Truckee River, Angora Creek, and the unnamed creek within the study area to prevent discharge of untreated stormwater into these surface water bodies. Anticipate runon from upslope groundwater seeps west of the Upper Truckee River, and reroute it around the construction zone.

- Salvage topsoil to be reused on-site during project-related grading.

- Provide winterization that isolates and protects disturbed areas from high streamflow on the Upper Truckee River and Angora Creek (up to the 50-year event).

- Secure a source of transportation and a location for deposition and/or storage of all excavated and imported materials at the project site. Protect stockpiled and transported materials or debris from wind or water erosion. Store soil and other loose material at least 100 feet from the active channel during the construction season.

- Avoid overwinter storage of materials, vehicles, equipment, or debris within the 100-year floodplain.

- Provide site-specific and reachwide dewatering/bypassing plans that indicate the scheduling approach and or maximum diverted flows to minimize risks from summer thunderstorms, specific diversion/bypass/ dewatering methods and equipment, defined work areas and diversion locations, the types and locations of temporary BMPs for the diversions and reintroduction points, measures and options for treating turbid water before release back to the channel, and stated water quality performance standards.

- Provide wetting flows before activation of new and reconnected river channel sections based on a ”channel seasoning” plan that indicates the water source(s); volumes and duration required; phased placement of clean, washed gravels; and the measures and options for treating potentially turbid water.

- Monitor the status and effectiveness of temporary erosion control, stormwater facilities, and flood flow protections throughout the construction area, including each of the internally draining zones that could separately discharge to various surface water bodies. Monitor turbidity in the Upper Truckee River upstream and downstream of the construction zone and, if needed, to further describe background, upstream in Angora Creek. Monitoring shall be conducted by the engineer or its qualified representative on a regular basis during summer construction and on an event basis when runoff equals or exceeds the BMP design standards. Document failures and/or threats of BMP failures, and identify remedial measures implementation. Repair BMP failures within 24 hours of documentation.

Mitigation Measure 3.6-1B (Alt. 2): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Surface Erosion from Discharging to Creek or River Channels.

This mitigation measure is similar to Mitigation Measure 3.3-1 (Alt 2). Stormwater improvements shall be incorporated into the final detailed project design. Before issuance of grading permits, State Parks shall submit a detailed stormwater drainage plan to El Dorado County and TRPA for review and approval. The plan shall identify the locations, sizes, and types of facilities used to retain and treat project related runoff. The detailed design shall meet the following minimum performance criteria:

- Stormwater facilities shall be installed in the sub-watershed of each existing natural drainages (e.g., swales, seeps, creeks) that will experience project-related changes to topographic, soil, and/or vegetation cover;

- Peak runoff discharge from the stormwater system to each of the existing natural drainage swales, creeks, or the Upper Truckee River shall be equal or less than pre-project conditions up to the 10-year event;

- Nuisance perennial discharge of excess irrigation water shall be prevented; and

- Where rerouting of drainages or point discharges from the stormwater facilities are necessary, those discharges shall be designed to prevent streambed or streambank erosion in the receiving water body.

The stormwater designs and drainage plan shall strive to incorporate BMPs where feasible, including but not limited to:

- pervious pavement or pavers,
- strategically placed bioswales and vegetated swales,
- constructed wetlands and detention ponds,
- rock- or boulder-lined areas to prevent disruption or erosion, and
- training of maintenance personnel on stormwater pollution prevention measures.

While Impact 3.4-6 (Alt. 2) will remain significant and unavoidable due to the strict water quality criteria with implementation of Mitigation Measure 3.6-1A (Alt. 2) and 3.6-1B (Alt 2) as described above, the likelihood of erosion, sedimentation, and loss of topsoil would be minimized by design measures and BMPs with performance requirements as appropriate, and Impact 3.6-1 (Alt. 2) would be less than significant.

IMPACT 3.6-2 (Alt. 2)	Risks to People and Structures Caused by Strong Seismic Ground Shaking. *Fault activity in the project vicinity could subject people and structures within the study area to damage or other risks associated with strong seismic ground shaking. This impact would be* ***potentially significant****.*

As discussed in the setting, the potential for earth shaking activity to occur is low to moderate according to probabilistic modeling of the project vicinity. However fault activity in the Tahoe Basin may could result in exposure to adverse effects, including the risk of injury or death to people and loss of structures within the study area because of strong seismic ground shaking effects. New habitable structures are not proposed under Alternative 2; however, a new bridge and restroom with sewer connection would be constructed. The 2007 CBC requirements for seismic design, which were adopted in 2008, require that site-specific seismic investigations be performed. Furthermore, Alternative 2 would involve modifications where shallow groundwater occurs and where tree removal would be extensive. Although the grading would be limited by designing the golf course to the existing topography, tree removal could cause instability in soils.

Even though modeling probability of earth shaking activity for the area is somewhat low there is a potential for damage or injury from strong seismic ground shaking within the study area, the risk to people and structures from strong seismic ground shaking would be a potentially significant impact.

Mitigation Measure 3.6-2 (Alt 2): Prepare a Final Geotechnical Engineering Report, and Implement All Applicable Recommendations.

Before construction begins, State Parks will obtain the services of a licensed geotechnical engineer to prepare a final engineering report for the proposed project. The final engineering report shall address and make recommendations on the following:

- structural/seismic design of bridges;
- site preparation, including tree removal;
- appropriate sources and types of fill;
- potential need for soil amendments;
- access roads, pavement, asphalt, and parking areas;
- shallow groundwater table; and
- soil and slope stability.

All recommendations contained in the final engineering report shall be implemented by State Parks. Special recommendations contained in the engineering report shall be noted on the grading plans and implemented as appropriate before construction begins. Design and construction of all phases of the project shall be in accordance with the 2007 or subsequently adopted CBC.

With implementation of Mitigation Measure 3.6-2 (Alt. 2) as described above, the potentially significant impact of seismically induced risks to people and structures would be minimized by requiring that the design recommendations of a geotechnical engineer in accordance with the 2007 or subsequently adopted CBC be incorporated into infrastructure, and Impact 3.6-2 (Alt. 2) would be less than significant.

IMPACT 3.6-3 (Alt. 2) **Land Coverage Changes.** *Alternative 2 would involve removing and relocating coverage primarily associated with golf course land uses and some trails within LCD 1b to allow for restoration of the floodplain, Upper Truckee River and lower Angora Creek, while still making an 18-hole regulation golf course available to the public. Alternative 2 decreases coverage in LCDs 1b and 1c. Coverage within LCD 3 will stay the same and no coverage will be located in LCD 6, similar to existing conditions. Also, existing coverage within LCD 1b will be relocated to higher capability land (LCD 5). Overall, the proposed coverage reduction within LCD 1b, SEZ lands, the relocated coverage to higher capability (LCD 5) and previously disturbed lands, and restoration of floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River would provide a net environmental benefit. For this reason, this would be a* ***beneficial*** *effect.*

TRPA evaluates both hard and soft coverage within Washoe Meadow State Park and Lake Valley SRA as one combined, contiguous area, all as coverage not separated into hard and soft coverage. For comparative purposes coverage has been presented separately by existing boundaries of the SP and SRA and by hard and soft coverage proposed for each alternative in Tables 3.6-8 and 3.6-9. Alternative 2 would involve removing and relocating coverage primarily associated with golf course land uses and some trails within LCD 1b to allow for restoration of the floodplain, SEZ, the Upper Truckee River and lower Angora Creek while still making an 18-hole regulation golf course available to the public. The golf course landscaping removed from SEZ and floodplain adjacent to the Upper Truckee River and Angora Creek would allow for improved geomorphic function and lessen golf course related water quality impacts to the river; however, landscaping is not considered coverage by TRPA definition (See section 3.4 Geomorphology and Water Quality for additional information on water quality impacts and Regulatory Setting above for additional discussion on TRPA land capability and coverage).

Coverage allowed is based on TRPA allowable base coverage or the pre-1972 “grandfathered” coverage (includes existing and banked pre-1972 coverage), whichever is greater. Coverage allowed within 1b in the study area (both units) is 480,521 sf. Under Alternative 2, 378,499 sf of coverage is proposed in LCD 1b, including cart paths, bridges, designated trails, parking area improvements, as well as other existing coverage that would not be modified. This is a decrease of 37,853 sf from existing coverage (416, 352 sf) within LCD 1b. Coverage allowed within LCD 1c in the study area is 315,714 sf. Under Alternative 2, 55,020 sf of coverage is proposed in LCD 1c, including cart paths, small bridges, designated trails, as well as other existing coverage that would not be modified. This is a decrease of 86,562 sf from existing coverage (141,582 sf) within LCD 1c.

Coverage allowed within LCD 3 in the study area is 109,025 sf. No new coverage is proposed however 56,365 sf of existing access roads and trail coverage would continue to be used in LCD 3. Coverage allowed within LCD 5 in the study area is 1,528,676 sf. Under Alternative 2, 150,659 sf of coverage is proposed in LCD 5, including cart paths, designated trails, the restroom facility, some of the parking improvements, as well as other existing coverage that would not be modified. This is an increase in coverage by 10,730 sf, however LCD 5 is higher capability land than lands previously discussed where coverage is being relocated from. Furthermore, coverage proposed within LCD 5 does not exceed that allowed by TRPA. Coverage allowed within LCD 6 in the study area is 22,559 sf. No coverage is proposed under Alternative 2 within LCD 6. There are no areas within the study area classified as LCD 1a or 7.

Table 3.6-8 Alternative 2 Coverage Impacts Summary for Washoe Meadows State Park Within the Study Area (square feet)							
Land Class	Gross Area[1]	Hard/ Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	5,039,839	7,913/126,401	50,398	130,133	30,757	NR	Beneficial
1c	539,184	13,237/41,783	5,392	141,582	174,132	NR	Beneficial
2	–	–	–	–	–	–	–
3	2,180,496	0/55,810	109,025	56,365	19,182	NR	NI
4	–	–	–	–	–	–	–
5	5,246,359	35,282/100,042	1,311,590	126,344	106,997	NR	NI
6	–	–	–	–	–	–	–
7	–	–	–	–	–	–	–
Total	**13,005,878**	**56,432/324,036**	**1,476,405**	**454,424**	**331,068**	**NR**	**Beneficial**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA located within the study area.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Table 3.6-9 Alternative 2 Coverage Impacts Summary for Lake Valley State Recreation Area (square feet)							
Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	8,396,269	229,631/14,554	83,963	286,219	33,412	NR	Beneficial
1c[2]	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	–	–	–	–	–	–	–
4	–	–	–	–	–	–	–
5	868,343	12,742/2,593	217,086	13,585	5,126	NR	NI
6	75,197	–	22,559	–	–	NR	NI
7	–	–	–	–	–	–	–
Total	**9,339,809**	**242,373/17,147**	**323,608**	**299,804**	**38,538**	**NR**	**Beneficial**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA within the study area.
[2]Coverage estimate does not include 3,312 sf of existing pre-1972 golf course related coverage located on Conservancy property.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land; however, additional development in the remaining park area would not occur because most of the park is within sensitive, low-capability lands. While potential coverage modifications in relation to these improvements cannot be calculated at this time it is expected that any new coverage will be within that allowed by TRPA and coverage modifications would go through their own environmental review process under TRPA.

Alternative 2 decreases coverage in LCDs 1b and 1c. Coverage within LCD 3 will stay the same and no coverage will be located in LCD 6, similar to existing conditions. Existing coverage within LCD 1b will be relocated to higher capability land (LCD 5) to allow for restoration of the river, floodplain and SEZ. Coverage relocated on-site is expected to occur at a 1:1 ratio as allowed for an EIP project per the Code of Ordinances (discussed in the Regulatory section above). Additional coverage not used for relocation would be banked by State Parks for potential use within the study area or on other State Parks land as appropriately allowed by TRPA. Overall, the proposed coverage reduction within LCD 1b, SEZ lands, the relocated coverage in higher capability (LCD 5) and previously disturbed lands, and restoration of floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River would provide a net environmental benefit. For this reason, this would be a beneficial effect.

No mitigation is required.

IMPACT 3.6-4 (Alt. 2)	Result in Loss of Availability of Known Mineral Resources. *Under Alternative 2, golf course development and restoration activities would occur within the historical gravel and sand quarry located within Washoe Meadows SP. The quarry currently has a limited viable resource, it is no longer being mined, components have been restored, and the proposed project would cover existing mineral resources at the site with turf grass and a cart path. This impact would be* ***less than significant****.*

Under Alternative 2, golf course development and restoration activities would occur within the former gravel and sand quarry within Washoe Meadows SP. The quarry has not been in use since before State Parks acquired the property in 1985 and currently has a limited viable resource. The 17-acre site consists of three contiguous lobes. The middle lobe was formerly the deepest, with the back headwall approximately 30 feet tall. This lobe was restored with fill material from the Lower Westside Restoration Project in 2001 and revegetated in 2002. The headwall of the eastern lobe intercepts the water table from a fen located upslope, creating an artificial wetland on the former quarry floor. The quarry floor would be restored to improve function and habitat within the area. The western lobe is the shallowest, and several years ago, a ditch was dug to drain it toward the northeast. The ditch has since headcut and gullied. This area would be regraded and restored as part of Alternative 2. Both the eastern and western pits have asphalt and brick waste within them dating from the time of quarry mining. These materials would be removed and much of the area used within the golf course footprint. Because the quarry is no longer in use, there are no plans to use it in the future, some areas have been restored, and other areas are slated for restoration or to be covered by only golf course turf and cart paths and could therefore be accessed at a later date. This impact is less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.6-1 (Alt. 3)	**Soil Erosion, Sedimentation, and Loss of Topsoil.** *Alternative 3 would not include beneficial modifications to offset the existing erosion caused by prior disturbances within Washoe Meadows S; however, implementing this alternative would improve existing conditions related to erosion and sedimentation by removing undersized bridges and golf course uses adjacent to the Upper Truckee River and Angora Creek within the SRA. Nevertheless, project-related construction, grading, and stockpile storage associated with implementation of this alternative would result in exposure of soil to potential wind and water erosion until the project site is effectively stabilized and revegetated. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.6-1 (Alt. 2) except that it would not include the extensive tree removal and beneficial improvements to offset past disturbance within Washoe Meadows SP. Under Alternative 3 the golf course would stay completely within the existing footprint on the east side of the Upper Truckee River. Golf course uses would be removed from the floodplain and SEZ adjacent to the Upper Truckee River and Angora Creek. The approach to Alternative 3 includes salvaging, reusing, protecting, and minimizing removal of on-site resources, which would assist in reducing erosion and loss of topsoil. The amount of salvageable topsoil would be limited because disturbance would be less than under Alternative 2.

Implementing Alternative 3 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb the active floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek, with phasing (see Table 2-6), access, staging, and storage (see Exhibit 2-9) similar to those under Alternative 2; however, upland disturbance would be much less.

Similar to Alternative 2, permits and approvals would be required from several entities, but the specific measures, performance standards, and enforcement elements required are not yet known. The same general construction management measures and general BMPs would be included as for Alternative 2, with similar dewatering approaches and winterization needs. Similar to Alternative 2, it is not reasonably foreseeable that a large storm runoff or streamflow event would exceed temporary capacity during construction.

Based on the conceptual information regarding proposed construction management for Alternative 3, it remains possible that erosion, sedimentation, and loss of topsoil could occur. This impact would be potentially significant.

Mitigation Measure 3.6-1 (Alt. 3): Prepare and Implement Effective Site Management Plans

This mitigation measure is identical to Mitigation Measure 3.6-1A (Alt. 2).

Mitigation Measure 3.6-1B (Alt. 3): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Surface Erosion from Discharging to Creek or River Channels.

This mitigation measure is identical to Mitigation Measure 3.6-1B (Alt. 2).

With implementation of Mitigation Measure 3.6-1A (Alt. 3) and Mitigation Measure 3.6-1B (Alt. 3), Impact 3.6-1 (Alt. 3) would be less than significant, for the same reasons as described for Impact 3.6-1 (Alt. 2).

IMPACT 3.6-2 (Alt. 3)	**Risks to People and Structures Caused by Strong Seismic Ground Shaking.** *Active faults in the project vicinity could subject people and structures within the study area to damage from strong seismic ground shaking; however, Alternative 3 does not include construction of any new structures or parking areas and does not include extensive tree removal, which could cause unstable soils. This impact would be* ***less than significant****.*

As discussed in the setting, several faults in the Tahoe Basin may be capable of generating a large-magnitude earthquake, albeit the probability is fairly low exposure to adverse effects could occur, including the risk of injury or death to people and loss of structures within the study area because of strong seismic ground shaking effects. Although risk of exposure within the study area exists, no new structures or parking areas are proposed under Alternative, and this alternative does not include extensive tree removal, which could cause unstable soils. While, Alternative 3 does include removing existing bridges final design schematics will be prepared by a licensed engineer for both the river restoration and golf course modifications, furthermore, these components of the project would not cause potential risk to people or structures. This impact would be less than significant.

No mitigation is required.

IMPACT 3.6-3 (Alt. 3)	Land Coverage Changes. *Similar to Alternative 2, Alternative 3 would involve removing coverage primarily associated with golf course land uses within LCD 1b to allow for restoration of the floodplain, SEZ, Upper Truckee River and lower Angora Creek, improving geomorphic function and lessening golf course related water quality impacts to the river. Alternative 3 will limit the size of the golf course to areas within the existing footprint and outside of the active floodplain. Golf infrastructure in the active floodplain would be removed including cart paths and all bridges on the Upper Truckee River and Angora Creek. No coverage changes are proposed on the west side of the river. Overall, the proposed coverage reduction within LCD 1b, SEZ lands, and restoration of floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River would provide a net environmental benefit. For this reason, this would be a* ***beneficial*** *effect.*

Similar to Alternative 2, Alternative 3 would involve removing coverage primarily associated with golf course land uses within LCD 1b to allow for restoration of the floodplain, SEZ, Upper Truckee River and lower Angora Creek, improving geomorphic function and lessening golf course related water quality impacts to the river. Alternative 3 will limit the size of the golf course to areas within the existing footprint and outside of the active floodplain. Golf infrastructure in the active floodplain will be removed including cart paths and all bridges on the Upper Truckee River and Angora Creek. No coverage changes are proposed on the west side of the river. Alternative 3 does not include and restroom facility or paving of the unimproved parking area. For comparative purposes coverage has been presented separately by existing boundaries of the SP and SRA and by hard and soft coverage proposed for each alternative in Tables 3.6-10 and 3.6-11.

Coverage allowed is based on TRPA allowable base coverage or the pre-1972 "grandfathered" coverage (includes existing and banked pre-1972 coverage), whichever is greater. Coverage allowed within 1b in the study area is 480,521 sf. Under Alternative 3, 351,094 sf of coverage is proposed in LCD 1b, including cart paths, designated trails, as well as other existing coverage that would not be modified. This is a decrease of 65,259 sf from existing coverage within LCD 1b. Coverage allowed within LCD 1c is 315,714 sf and within LCD 3 is 109,025 sf. While no new coverage is proposed 141,582 sf of existing coverage within LCD 1c and 56,365 sf within LCD 3, including trails and access roads will continue to be used under Alternative 3. Coverage allowed within LCD 5 in the study area is 1,528,676 sf. Under Alternative 3, 121,231 sf of coverage is proposed in LCD 5, including cart paths as well as other existing coverage that would not be modified. This is decrease in coverage by 18,698 sf. Coverage allowed within LCD 6 in the study area is 22,559 sf no coverage is proposed under Alternative 3 within LCD 6. There are no areas within the study area classified as LCD 1a or 7.

As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land; however, additional development in the remaining park area would not occur because most of the park is within sensitive, low-capability lands. While potential coverage modifications in relation to these improvements cannot be calculated at this time it is expected that any new coverage will be within that allowed by TRPA and coverage modifications would go through their own environmental review process under TRPA.

Table 3.6-10
Alternative 3 Coverage Impacts Summary for Washoe Meadows State Park (square feet)

Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	5,039,839	1,122/129,011	50,398	130,133	30,757	NR	NI
1c	539,184	0/141,582	5,392	141,582	174,132	NR	NI
2	–	–	–	–	–	–	–
3	2,180,496	0/56,365	109,025	56,365	19,182	NR	NI
4	–	–	–	–	–	–	–
5	5,246,359	0/108,844	1,311,590	126,344	106,997	NR	NI
6	–	–	–	–	–	–	–
7	–	–	–	–	–	–	–
Total	**13,005,878**	**1,122/435,802**	**1,476,405**	**454,424**	**331,068**	**NR**	**NI**

[1]Gross area is defined as gross area within existing boundaries for Washoe Meadows SP and Lake Valley SRA located in the study area.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Table 3.6-11
Alternative 3 Coverage Impacts Summary for Lake Valley State Recreation Area (square feet)

Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact to Land Coverage
1a	–	–	–	–	–	–	–
1b	8,396,269	206,356/14,605	83,963	286,219	33,412	NR	Beneficial
1c[2]	–	–	–	–	–	–	–
2	–	–	–		–	–	–
3	–	–	–		–	–	–
4	–	–	–		–	–	–
5	868,343	9,793/2,594	217,086	13,585	5,126	NR	Beneficial
6	75,197	–	22,559		–	NR	NI
7	–	–	–		–	–	–
Total	**9,339,809**	**216,149/17,199**	**323,608**	**299,804**	**38,538**	**NR**	**Beneficial**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadow SP and Lake Valley SRA within the study area and not proposed boundary changes.
[2] Coverage estimate does not include 3,312 sf of existing pre-1972 golf course related coverage located on Conservancy property.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Alternative 3 decreases coverage in LCDs 1b and 5. Coverage within LCDs 1c and 3 will stay the same and no coverage will be located in LCD 6, similar to existing conditions. Coverage relocated on-site is expected to occur at a 1:1 ratio as allowed for an EIP project per the Code of Ordinances (discussed in the Regulatory section above). Additional coverage not used for relocation would be banked by State Parks for potential use within the study area or on other State Parks land as appropriately allowed by TRPA. Overall, the proposed coverage reduction within LCD 1b, SEZ lands, and restoration of active floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River and Angora Creek would provide a net environmental benefit. For this reason, this would be a beneficial effect.

No mitigation is required.

IMPACT 3.6-4 (Alt. 3) **Result in Loss of Availability of Known Mineral Resources.** *Alternative 3 would not include any changes within the historical gravel and sand quarry located within Washoe Meadows SP. The quarry currently has a limited viable resource and is no longer being mined. Therefore, **no impact** would occur.*

Alternative 3 would not include any modifications within the former gravel and sand quarry or anywhere within Washoe Meadows SP outside of the historic meander belt. The quarry has not been in use since before State Parks acquired the property in 1985, and currently it has limited viable resources. No impact would occur.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.6-1 (Alt. 4) **Soil Erosion, Sedimentation, and Loss of Topsoil.** *Alternative 4 would not include beneficial modifications to offset the existing erosion caused by prior disturbances within Washoe Meadows SP or provide a buffer between the golf course and the river; however, implementing this alternative would improve existing conditions related to erosion and sedimentation by removing two undersized bridges and incorporating stabilization measures into the Upper Truckee River. Nevertheless, project-related construction, grading, and stockpile storage associated with implementing Alternative 4 would result in exposure of soil to potential wind and water erosion until the project site is effectively stabilized and revegetated. This impact would be **potentially significant**.*

This impact is similar to Impact 3.6-1 (Alt. 3) except that Alternative 4 would not provide a buffer between the golf course and the Upper Truckee River and Angora Creek. Implementing Alternative 4 would limit natural channel adjustments to historic disturbances and reduce the effects of undersized bridges within the study area by stabilizing the streambed elevation, protecting streambanks, and removing two bridges to be replaced by one longer spanned bridge. These modifications would reduce overall erosion of the streambed and banks, but sediment sources related to past disturbance within Washoe Meadows SP would not be reduced under Alternative 4.

Alternative 4 would have a shorter overall construction period than Alternatives 2 and 3 (2–3 years). Most of the construction disturbance would be adjacent to and within the existing main channel of the Upper Truckee River, and at the mouths of Angora Creek and the unnamed creek (see Alternative 4 construction schedule section in Table 2-8). Only minor areas of floodplain reconstruction and golf course restroom facilities and unimproved parking area paving and BMP improvements would be completed outside of the active channel. The only area where topsoil could potentially be salvaged would be within the unimproved parking areas. Disturbance areas, access routes, and most staging areas would be within the 100-year floodplain, whereas the staging location west of the Upper Truckee River would be outside the 100-year floodplain, similar to Alternative 2. No modifications are proposed within Washoe Meadows SP.

The project permits and approvals would be the same as under Alternative 2. Conceptual approaches to dewatering have been identified for various elements of Alternative 4 in-channel work (see Chapter 2, "Project

Alternatives"), but specific measures have not yet been determined. Efforts would be made to work as quickly as possible to move from initial disturbance through final revegetation throughout, but it is expected that disturbed areas would be exposed to winter conditions between summer construction seasons. Winterization protection could be needed throughout the construction zone, and possible overwinter use of staging, storage, or access areas has not yet been determined.

All temporary stormwater controls and/or overwinter flood flow protections would be designed and sized to meet the same standards as Alternative 2. Similar to Alternative 2, it is not reasonably foreseeable that a large storm runoff or streamflow event would exceed temporary capacity occurring during construction.

Based on the conceptual information regarding proposed construction management for Alternative 4, it remains possible that erosion, sedimentation, and loss of topsoil could occur. This impact would be potentially significant.

Mitigation Measure 3.6-1 (Alt. 4): Prepare and Implement Effective Site Management Plans

This mitigation measure is identical to Mitigation Measure 3.6-1A (Alt. 2).

Mitigation Measure 3.6-1B (Alt. 4): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Surface Erosion from Discharging to Creek or River Channels.

This mitigation measure is identical to Mitigation Measure 3.6-1B (Alt. 2).

With implementation of Mitigation Measure 3.6-1A (Alt. 4) and Mitigation Measure 3.6-1B (Alt. 4), Impact 3.6-1 (Alt. 4) would be less than significant, for the same reasons as described for Impact 3.6-1 (Alt. 2).

IMPACT 3.6-2 (Alt. 4)	Risks to People and Structures Caused by Strong Seismic Ground Shaking. *Fault activity in the project vicinity could subject people and structures within the study area to damage or other risks associated with strong seismic ground shaking. This impact would be **potentially significant**.*

This impact is similar to Impact 3.6-2 (Alt. 2). As previously discussed, the potential for earth shaking activity to occur is low to moderate according to probabilistic modeling of the project vicinity; however fault activity in the Tahoe Basin may could result in exposure to adverse effects, including the risk of injury or death to people and loss of structures within the study area because of strong seismic ground shaking effects. New habitable structures are not proposed under Alternative 4, however, a new bridge and restroom with sewer connection would be constructed. Tree removal would be much less under Alternative 4 than Alternative 2.

Even though modeling probability of earth shaking activity for the area is somewhat low there is a potential for damage or injury from strong seismic ground shaking within the study area, the risk to people and structures from strong seismic ground shaking would be a potentially significant impact.

Mitigation Measure 3.6-2 (Alt 2): Prepare a Final Geotechnical Engineering Report, and Implement All Applicable Recommendations.

This mitigation measure is identical to Mitigation Measure 3.6-2 (Alt. 2).

With implementation of Mitigation Measure 3.6-2 (Alt. 4), Impact 3.6-2 (Alt. 4) would be less than significant, for the same reasons as described for Impact 3.6-2 (Alt. 2).

IMPACT 3.6-3 (Alt. 4)

Land Coverage Changes. *Alternative 4 would not involve removing and relocating coverage within LCD 1b to restore the SEZ and floodplain adjacent to the Upper Truckee River and Angora Creek but instead would limit natural channel adjustments to historic disturbances and reduce the effects of undersized bridges within the study area by stabilizing the streambed elevation, protecting streambanks, and removing two bridges to be replaced with one longer spanned bridge while still making an 18-hole regulation golf course available to the public within the existing golf course footprint. Golf course landscaping and infrastructure will continue to occupy lands adjacent to the Upper Truckee River and Angora Creek, thereby limiting water quality improvements of the project compared to Alternative 2. Changes proposed include cart paths, a restroom facility near hole 5, paving and BMP installation at the unimproved parking lot. Most existing coverage would not be modified under Alternative 4. Alternative 4 increases coverage in LCDs 1b, 1c, and 5; however, proposed coverage is still within that allowed within the study area as determined by TRPA. Coverage within LCD 3 will decrease and no coverage will be located in LCD 6, similar to existing conditions. Therefore, this impact is* ***less than significant.***

Alternative 4 would not involve removing and relocating coverage within LCD 1b to restore the SEZ and floodplain adjacent to the Upper Truckee River and Angora Creek but instead would limit natural channel adjustments to historic disturbances and reduce the effects of undersized bridges within the study area by stabilizing the streambed elevation, protecting streambanks, and removing two bridges to be replaced with one longer spanned bridge while still making an 18-hole regulation golf course available to the public within the existing golf course footprint. Golf course landscaping and infrastructure will continue to occupy lands adjacent to the Upper Truckee River and Angora Creek, thereby limiting water quality improvements of the project compared to Alternative 2. Coverage for Washoe Meadows SP and Lake Valley SRA under Alternative 4 is presented in Tables 3.6-12 and 3.6-13. Changes proposed include cart paths, a restroom facility near hole 5, paving and BMP installation at the unimproved parking lots. Coverage allowed is based on TRPA allowable base coverage or the pre-1972 “grandfathered” coverage (includes existing and banked pre-1972 coverage), whichever is greater. Most existing coverage would not be modified under Alternative 4.

Table 3.6-12
Alternative 4 Coverage Impacts Summary for Washoe Meadows State Park (square feet)

Land Class	Gross Area[1]	Hard/ Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	5,039,839	1,122/129,011	50,398	130,133	30,757	NR	LTS
1c	539,184	0/141,582	5,392	141,582	174,132	NR	NI
2	–	–	–	–	–	–	–
3	2,180,496	0/56,365	109,025	56,365	19,182	NR	NI
4	–	–	–	–	–	–	–
5	5,246,359	0/108,844	1,311,590	126,344	106,997	NR	LTS
6	–	–	–	–	–	–	–
7	–	–	–	–	–	–	–
Total	**13,005,878**	**1,122/435,802**	**1,476,405**	**454,424**	**331,068**	**NR**	**LTS**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA located within the study area.
NR = none required.
LTS = less than significant.
NI = no impact.
Source: Data provided by State Parks 2010

Coverage allowed within 1b in the study area is 480,521 sf. Under Alternative 4, 423,768 sf of coverage is proposed in LCD 1b, including primarily existing infrastructure with some modified cart paths and removal of two bridges with one replacement bridge, a new restroom as well as other existing coverage that would not be modified. This is an increase of 7,416 sf from existing coverage within LCD 1b; however, it is still within coverage allowed by TRPA. Coverage proposed in 1c includes some cart path and parking modifications as well as existing coverage that would not be modified. Coverage allowed within LCD 1c is 315,714 sf and within LCD 3 is 109,025 sf. Under Alternative 4, 141,582 sf of existing coverage is in LCD 1c56,365 sf of existing trails and access roads will continue to be used. Coverage allowed within LCD 5 in the study area is 1,528,676 sf. Under Alternative 4, 156,174 sf of coverage is proposed in LCD 5, including cart paths and parking area improvements, as well as other existing coverage that would not be modified. This is an increase in coverage by 16,245 sf, however LCD 5 is high capability land and coverage proposed is still within that allowed by TRPA within LCD 5. Coverage allowed within LCD 6 in the study area is 22,559 sf no coverage is proposed under Alternative 4. There are no areas within the study area classified as LCD 1a or 7.

Table 3.6-13
Alternative 4 Coverage Impacts Summary for Lake Valley State Recreation Area (square feet)

Land Class	Gross Area (sq. ft.)[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	8,396,269–	277,281/16,354	83,963	286,219	33,412	NR	LTS
1c[2]	–	–	–	–	–	–	–
2	–	–	–		–	–	–
3	–	–	–		–	–	–
4	–	–	–		–	–	–
5	868,343	43,887/3,443	217,086	13,585	5,126	NR	LTS
6	75,197	–	22,559		–	NR	NI
7	–	–	–		–	–	–
Totals	**9,339,809**	**321,168/19,797**	**323,608**	**299,804**	**38,538**	**NR**	**LTS**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadow SP and Lake Valley SRA and not proposed boundary changes.
[2] Coverage estimate does not include 3,312 sf of existing pre-1972 golf course related coverage located on Conservancy property.
NR = none required.
LTS = less than significant
NI = no impact.
Source: Data provided by State Parks 2010

As part of its normal administrative responsibilities (separate from this project), State Parks would prepare interim management guidelines for Washoe Meadows SP which would provide additional guidance for protection of resources and management of permissible uses for that unit. The management plan would likely include small parking areas, signage, and some trail improvements on higher capability land; however, additional development in the remaining park area would not occur because most of the park is within sensitive, low-capability lands. While potential coverage modifications in relation to these improvements cannot be calculated at this time it is expected that any new coverage will be within that allowed by TRPA and coverage modifications would go through their own environmental review process under TRPA.

Alternative 4 increases coverage in LCDs 1b and 5; however, proposed coverage is still within that allowed as determined by TRPA. Coverage within LCD 1 and 3 will stay the same as under existing conditions and no coverage will be located in LCD 6, similar to existing conditions. Coverage relocated on-site is expected to occur at a 1:1 ratio as allowed for an EIP project per the Code of Ordinances (discussed in the Regulatory section above). Additional coverage not used for relocation would be banked by State Parks for potential use within the study area or on other State Parks land as appropriately allowed by TRPA. Therefore, this impact is less than significant.

No mitigation is required.

IMPACT 3.6-4 (Alt. 4)	Result in Loss of Availability of Known Mineral Resources. *Alternative 4 does not include any changes within the historical gravel and sand quarry located within Washoe Meadows SP. The quarry currently has a limited viable resource and is no longer being mined. Therefore,* ***no impact*** *would occur.*

This impact is identical to Impact 3.6-4 (Alt. 3). Alternative 4 does not include any modifications within the former gravel and sand quarry or anywhere within Washoe Meadows SP. The quarry has not been in use since before State Parks acquired the property in 1985, and it currently has limited viable resources. No impact would occur.

No mitigation is required.

Alternative 5: River and Meadow Ecosystem Restoration and Decommissioned Golf Course

IMPACT 3.6-1 (Alt. 5)	Soil Erosion, Sedimentation, and Loss of Topsoil. *Alternative 5 would not include beneficial modifications to offset the existing erosion caused by prior disturbances within Washoe Meadows SP; however, implementing this alternative would improve existing conditions related to erosion and sedimentation by removing undersized bridges and golf course uses adjacent to the Upper Truckee River and Angora Creek within the SRA. Nevertheless, project-related construction, grading, and stockpile storage associated with implementation of Alternative 5 would result in exposure of soil to potential wind and water erosion until the project site is effectively stabilized and revegetated. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.6-1 (Alt. 2), because it would not include the extensive tree removal and beneficial improvements to offset past disturbance within Washoe Meadows SP proposed under Alternative 2. Under Alternative 5, the golf course would be completely restored as SEZ, meadow, and floodplain habitat, (although future planning efforts may limit the restored area); however, the clubhouse, maintenance yard, and parking would remain. Alternative 5 includes salvaging, reusing, protecting, and minimizing removal of on-site resources, which would assist in reducing erosion and loss of topsoil, but it is expected that salvageable topsoil as a resource would be limited because disturbance would be less than under Alternative 2, and topsoil within the existing golf course would be used for revegetation of that area.

Implementing Alternative 5 would require 3–4 years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb the active floodplain and the main channels of the Upper Truckee River, Angora Creek, and the unnamed creek, with phasing (see Table 2-6), access, staging, and storage (see Exhibit 2-9) similar to Alternative 2; however, upland disturbance under Alternative 5 would be much less than under Alternative 2.

Similar to Alternative 2, permits and approvals would be obtained from several entities, but the specific measures, performance standards, and enforcement elements required are not yet known. The general construction management measures and general BMPs included for Alternative 2 would be included for this alternative, with similar dewatering approaches and winterization needs. Similar to Alternative 2, it is not reasonably foreseeable that a large storm runoff or streamflow event would exceed temporary capacity occurring during construction.

Based on the conceptual information regarding proposed construction management for Alternative 5, it remains possible that erosion, sedimentation, and loss of topsoil could occur. This impact would be potentially significant.

Mitigation Measure 3.6-1 (Alt. 5): Prepare and Implement Effective Site Management Plans

This mitigation measure is identical to Mitigation Measure 3.6-1A (Alt. 2).

Mitigation Measure 3.6-1B (Alt. 5): Provide On-Site Storm Drainage Facilities and Accompanying Stormwater Drainage Plan to Prevent Surface Erosion from Discharging to Creek or River Channels.

This mitigation measure is identical to Mitigation Measure 3.6-1B (Alt. 2).

With implementation of Mitigation Measure 3.6-1A (Alt. 5) and Mitigation Measure 3.6-1B (Alt. 5), Impact 3.6-1 (Alt. 5) would be less than significant, for the same reasons as described for Impact 3.6-1 (Alt. 2).

IMPACT 3.6-2 (Alt. 5)	**Risks to People and Structures Caused by Strong Seismic Ground Shaking.** *Active faults in the project vicinity could subject people and structures within the study area to damage from strong seismic ground shaking; however, Alternative 5 does not include any new structures or a parking lot and does not include extensive tree removal, which could cause unstable soils. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.6-2 (Alt. 3), except that all golf course infrastructure would be removed from the study area, with the exception of the existing clubhouse, maintenance building, and parking areas, and pump station. As discussed in the setting, several faults in the Tahoe Basin may be capable of generating a large-magnitude earthquake, albeit the probability is fairly low exposure to adverse effects could occur, including the risk of injury or death to people and loss of structures within the study area because of strong seismic ground shaking effects. Although risk of exposure within the study area exists, no new structures or parking areas are proposed under Alternative, and this alternative does not include extensive tree removal, which could cause unstable soils. While, Alternative 5 does include removing existing bridges final design schematics will be prepared by a licensed engineer for both the river restoration and golf course modifications, furthermore, these components of the project would not cause potential risk to people or structures. This impact would be less than significant.

No mitigation is required.

IMPACT 3.6-3 (Alt. 5)	**Land Coverage Changes.** *Similar to Alternatives 2 and 3, Alternative 5 would involve removing coverage associated with golf course land uses and some trails within LCD 1b to allow for restoration of SEZ, the floodplain, Upper Truckee River and lower Angora Creek, improving geomorphic function and remove golf course related water quality impacts to the river. Golf infrastructure including cart paths and all bridges on the Upper Truckee River and Angora Creek will be removed. No coverage changes are proposed on the west side of the river; however, under Alternative 5 the golf course would be removed and other uses of Lake Valley SRA and Washoe Meadow SP would be evaluated during a separate planning process. Coverage removed as part of this alternative could be reused within the study area in the future. Alternative 5 decreases coverage in LCDs 1b, and 5. Coverage within LCD 1c and 3 will stay the same and no coverage will be located in LCD 6, similar to existing conditions. Overall, the proposed coverage reduction within LCD 1b, SEZ lands and restoration of floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River would provide a net environmental benefit. For this reason, this would be a* ***beneficial*** *effect.*

Similar to Alternatives 2 and 3, Alternative 5 would involve removing coverage associated with golf course land uses and some trails within LCD 1b to allow for restoration of SEZ, the floodplain, Upper Truckee River and lower Angora Creek, improving geomorphic function and remove golf course related water quality impacts to the river. No coverage changes are proposed on the west side of the river. Alternative 5 does not include and restroom facility or paving of the unimproved parking area. Golf infrastructure including cart paths and all bridges on the Upper Truckee River and Angora Creek will be removed and other uses of Lake Valley SRA and Washoe Meadow SP would be evaluated during a separate planning process. During the future planning process a temporary golf course, similar to the footprint presented in Alternative 3 may be left in place. Refer to Impact 3.6-3 (Alt 3) for a discussion of potential coverage impacts related to a temporary smaller course. Coverage removed as part of this alternative could be reused within the study area in the future. Coverage for Washoe Meadows SP and Lake Valley SRA under Alternative 5 is presented in Tables 3.6-14 and 3.6-15. Coverage allowed is based on TRPA allowable base coverage or the pre-1972 "grandfathered" coverage (includes existing and banked pre-1972 coverage), whichever is greater.

Table 3.6-14
Alternative 5 Coverage Impacts Summary for Washoe Meadows State Park (square feet)

Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	5,039,839	1,122/129,011	50,398	130,133	30,757	NR	NI
1c	539,184	0/141,582	5,392	141,582	174,132	NR	NI
2	–	–	–	–	–		–
3	2,180,496	0/56,365	109,025	56,365	19,182	NR	NI
4	–	–	–	–	–	–	–
5	5,246,359	0/108,844	1,311,590	126,344	106,997	NR	NI
6	–	–	–	–	–	–	–
7	–	–	–	–	–	–	–
Total	**13,005,878**	**1,122/335,802**	**1,476,405**	**454,424**	**331,068**	**NR**	**NI**

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadows SP and Lake Valley SRA located within the study area.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

Coverage changes presented here are based on the end result removing golf course infrastructure and landscaping while leaving the clubhouse, maintenance yard and parking area in place until alternative uses have been evaluated as part of a separate planning process. Coverage allowed within 1b in the study area is 480,521 sf. Under Alternative 5, 241,354 sf of coverage is proposed in LCD 1b, including the pump station, clubhouse and other existing coverage that would not be modified. This is a decrease of 174,999 sf from existing coverage within LCD 1b. Coverage allowed within LCD 1c is 315,714 sf and within LCD 3 is 109,025 sf. While no new coverage is proposed in LCDs 1c or 3, 141,582 sf within LCD 1c and 56,365 sf within LCD 3of existing coverage, including trails and access roads will continue to be used under Alternative 5. Coverage allowed within LCD 5 in the study area is 1,528,676 sf. Under Alternative 5, 121,431 sf of existing trails and access roads will continue to be used. Coverage within LCD 5 that is associated with cart paths will be removed. This will decrease coverage by 18,498 sf. Coverage allowed within LCD 6 in the study area is 22,559 sf no coverage is proposed under Alternative 5 within LCD 6. There are no areas within the study area classified as LCD 1a or 7. No interim management plan would be prepared under Alternative 5, therefore no associated parking or trail improvements would be expected.

Alternative 5 decreases coverage in LCDs 1b, and 5. Coverage within LCD 1c and 3 will stay the same and no coverage will be located in LCD 6, similar to existing conditions. Coverage relocated on-site is expected to occur at a 1:1 ratio as allowed for an EIP project per the Code of Ordinances (discussed in the Regulatory section above). Coverage not used would be banked by State Parks for potential use within the study area or on other State Parks land as appropriately allowed by TRPA. Overall, the proposed coverage reduction within LCD 1b, SEZ lands and restoration of floodplain currently occupied by golf course landscaping and infrastructure adjacent to the Upper Truckee River would provide a net environmental benefit. For this reason, this would be a beneficial effect.

No mitigation is required.

Table 3.6-15
Alternative 5 Coverage Impacts Summary for Lake Valley State Recreation Area (square feet)

Land Class	Gross Area[1]	Hard/Soft Coverage Proposed	Base Coverage Allowed per the Bailey System	Existing TRPA Verified Existing Coverage	Banked Coverage	LCD Coverage Mitigation	Impact on Land Coverage
1a	–	–	–	–	–	–	–
1b	8,396,269	102,866/8,355	83,963	286,219	33,412	NR	NI
1c[3]	–	–	–	–	–	–	–
2	–	–	–		–	–	–
3	–	–	–		–	–	–
4	–	–	–		–	–	–
5	868,343	10,143/2,444	217,086	13,585	5,126	NR	NI
6	75,197	–	22,559		–	NR	NI
7	–	–	–		–	–	–
Total	**9,339,809**	**113,866/10,799**	**323,608**	**299,804**	**38,538**	NR	NI

[1]Gross area is defined as gross area of existing boundaries for Washoe Meadow SP and Lake Valley SRA within the study area and not proposed boundary changes.
[2] Coverage estimate does not include 3,312 sf of existing pre-1972 golf course related coverage located on Conservancy property.
NR = none required.
NI = no impact.
Source: Data provided by State Parks 2010

IMPACT 3.6-4 (Alt. 5) **Result in Loss of Availability of Known Mineral Resources.** *Alternative 5 does not include any changes within the historical gravel and sand quarry located within Washoe Meadows SP. The quarry currently has a limited viable resource and is no longer being mined. Therefore,* ***no impact*** *would occur.*

Alternative 5 does not include any modifications within the former gravel and sand quarry or anywhere within Washoe Meadows SP outside of the historic meander belt. The quarry has not been in use since before State Parks acquired the property in 1985, and it currently has limited viable resources. No impact would occur.

No mitigation is required.

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3.7 SCENIC RESOURCES

This section describes the visual setting and scenic resources of the study area, identifies impacts on scenic quality that would result from Alternatives 1–5, and recommends mitigation measures intended to preserve scenic quality. The study area is visible from U.S. 50 (Roadway Travel Unit 36B), which is designated as a state scenic highway. The study area is not visible from Lake Tahoe, from features mapped in TRPA's Scenic Resource Evaluation, or from any TRPA-identified public recreation area. Therefore, a TRPA scenic analysis involving views related to the lake is not required for the proposed project. The impact analysis following the affected environment description is based on a qualitative evaluation of consistency with the TRPA Code of Ordinances and the TRPA Scenic Resource Environmental Thresholds. Consistency with TRPA goals and policies is presented in Section 3.2, "Land Use," Table 3.2-1. Cumulative scenic impacts are addressed in Section 3.16, "Cumulative Impacts." The project's effects on thresholds are described in Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.7.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

No Federal laws, regulations, or executive orders apply to scenic resources within the study area.

State

California's Scenic Highway Program

California's Scenic Highway Program was created by the California State Legislature in 1963 and is managed by the California Department of Transportation (Caltrans). The goal of this program is to preserve and protect scenic highway corridors from changes that would affect the aesthetic value of the land adjacent to highways. A highway may be designated "scenic" depending on how much of the natural landscape travelers can see, the scenic quality of the landscape, and the extent to which development intrudes on travelers' enjoyment of the view. Official designation requires a local jurisdiction to enact a scenic corridor protection program that protects and enhances scenic resources (Caltrans 2005).

U.S. 50 from Placerville to the South Lake Tahoe city limit is officially designated as a scenic highway by the state. Much of the study area is visible from U.S. 50. Existing views from U.S. 50 include the driving range, parking areas, clubhouse, several golf holes, and the Upper Truckee River riparian corridor and surrounding forest in the background, as well as private residences.

Lake Valley State Recreation Area General Plan

The *Lake Valley State Recreation Area General Plan*, as approved by the California Park and Recreation Commission in January 1988, provides guidelines for the long-term management and development of the Lake Valley State Recreation Area (SRA) in the Tahoe Basin. The plan contains the following policy that is applicable to scenic resources in the study area:

- **Policy Esthetic 1:** The department shall provide a setting within Lake Valley SRA that minimizes human influences as much as possible without obstructing the unit's purpose, which is presented as follows.

  > "The purpose of Lake Valley SRA is to make available to the people for their enjoyment and inspiration the 18-hole golf course, and the scenic Upper Truckee River and its environs."

Washoe Meadows State Park

No general plan has been prepared for Washoe Meadows State Park (SP), because it is an undeveloped unit. The "Purpose" of Washoe Meadows SP is to preserve and protect a wet meadow area associated with the Angora Creek and the Upper Truckee River at the southwestern side of the Lake Tahoe basin.

Tahoe Regional Planning Agency

TRPA regulates growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (Regional Plan). TRPA's Regional Plan, adopted in 1987, consists of several documents: the Goals and Policies, Code of Ordinances, Water Quality Management Plan, Plan Area Statements (PAS), and Scenic Quality Improvement Plan (SQIP).

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The Goals and Policies document of the 1987 Regional Plan establishes an overall framework for development and environmental conservation in the Lake Tahoe region. The Goals and Policies present the overall approach to meeting TRPA's environmental threshold carrying capacities, also known as thresholds (see below), and establish guiding policy for each resource element. The Conservation Element (Chapter IV) of the Goals and Policies document considers 10 subelements, including a Scenic subelement. The Scenic subelement states:

> Scenic quality is perhaps the most often identified natural resource of the Lake Tahoe Basin. The Basin affords views of a magnificent lake setting within a forested mountainous environment. The unique combination of visual elements provides for exceptionally high aesthetic values. The maintenance of the Basin's scenic quality largely depends on careful regulation of the type, location, and intensity of land uses.

The Scenic subelement contains the following goals and policies relevant to the proposed alternatives.

GOAL 1: Maintain and Restore the Scenic Qualities of the Natural Appearing Landscape. As with many of the Region's natural resources, the scenic qualities of the Basin are vulnerable to change. Modifying the natural scenic features of the Basin is a by-product of development, but such impacts need not be devastating. A coordinated effort that incorporates architectural design and location considerations in the project review process is a useful means for promoting scenic and aesthetic values. Policies to achieve this goal are consistent with the adopted environmental thresholds.

- **Policies:**

  1. All proposed development shall examine impacts to the identified landscape views from roadways, bike paths, public recreation areas, and Lake Tahoe.

  2. Any development proposed in areas targeted for scenic restoration or within a unit highly sensitive to change shall demonstrate the effect of the project on the 1982 travel route ratings of the scenic thresholds.

3. The factors or conditions that contribute to scenic degradation in identified areas need to be recognized and appropriately considered in restoration programs to improve scenic quality.

Code of Ordinances

The applicable provisions regarding aesthetic standards in the TRPA Code of Ordinances are summarized below.

Design Standards

Chapter 30 of the Code of Ordinances contains design standards, including standards for building design, landscaping, and lighting. The TRPA Design Review Guidelines summarize the requirements of the Code of Ordinances and guidelines or suggestions for attainment of the standards (TRPA 1989a: 30-5–30-6). Standards relevant to building design, landscaping, and lighting associated with the proposed alternatives, included within Standard 30.8 of the TRPA Design Review Guidelines, are listed below.

(2) Lighting Levels. Avoid consistent overall lighting and overly bright lighting. The location of lighting should respond to the anticipated use and should not exceed the amount of light actually required by users. Lighting for pedestrian movement should illuminate entrances, changes in grade, path intersections, and other areas along paths which, if left unlit, would cause the user to feel insecure. As a general rule of thumb, one foot candle per square foot over the entire project area is adequate. Lighting suppliers and manufacturers have lighting design handbooks which can be consulted to determine fixture types, illumination needs and light standard heights.

(5) Lighting Height. As a rule, the light source should be kept as low to the ground as possible while ensuring safe and functional levels of illumination. Area lighting should be directed downward with no splay of lighting directed offsite. The height of light fixtures or standards must meet the height limitations in Chapter 22. Direct light downward in order to avoid sky lighting. Any light source over 10 feet high should incorporate a cut-off shield to prevent the light source from being directly visible from areas offsite. The height of luminaries should be in scale with the setting and generally should not exceed 10–12 feet.

Scenic Standards

Chapter 30, "Design Standards," of the Code of Ordinances contains standards pertaining to scenic quality. Chapter 30 establishes a process for analyzing projects for scenic quality and defines those circumstances that require preparation of scenic assessments and/or other documents. It also requires payment of a security deposit equal to the cost of scenic mitigation measures for projects visible from nonattainment areas, and a 5-year review for continued presence and maintenance (described in more detail below). The study area would not be visible from any nonattainment areas. Section 30.12 describes scenic quality standards for roadway and shoreline units, and for public recreation areas and bicycle trails, as listed below.

- **30.12 Scenic Quality Standards:** All projects and activities shall comply with the following standards:
  - **30.12.A Roadway and Shoreline Unit Scenic Quality:** The project shall not cause a decrease in the numerical ratings assigned to roadway or shoreline units, including the scenic quality rating of the individual resources within each unit, as recorded in the 1982 Scenic Resources Inventory and shown in Tables 13-3, 13-5, 13-8, and 13-9 of the Study Report for the Establishment of Environmental Threshold Carrying Capacities, October 1982. The criteria for rating scenic quality as identified in the study report cited herein shall be used to determine if a project will cause a decrease in the numerical rating.

Plan Area Statements

The entire study area is located within PAS 119, Country Club Meadow (see Exhibit 3.2-1 in Section 3.2, "Land Use"). One special policy includes a reference to scenic quality. Special Policy 8 in PAS 119 (TRPA 1987: 2) states:

8. Remedial water quality and scenic quality improvements, including bill board removal, on land which exhibits noncompliance with the Agency's Regional Plan and Code of Ordinances shall be required.

Several billboards in the planning area have been removed in the past, in compliance with this policy.

Scenic Quality Improvement Program/Environmental Improvement Program

The SQIP was adopted to provide a program for implementing physical improvements to the built environment in the Tahoe Basin. The SQIP is intended to contribute to the attainment of the scenic resources thresholds in the Goals and Policies document of the Regional Plan (see above) and serves as an implementation guide for the Regional Plan. The SQIP is an overall action plan to specifically improve the scenic quality of 23 roadways and four shoreline travel routes that do not meet the scenic resources thresholds (TRPA 1989b: 1).

The SQIP (TRPA 1989b: 26) states:

> As a general rule, individual projects can be considered not to be contributing to threshold degradation when the project's individual design elements conform to or exceed adopted design standards, or the guidelines set forth in the Design Review Guidelines.

Design standards and design review guidelines are listed under the scenic standards and design review guidelines/contrast rating system sections, respectively, above. The Environmental Improvement Program (EIP) adopted in 1998 and updated in 2001 incorporates elements of the SQIP. The EIP includes a list of specific projects throughout the basin that are needed to attain and maintain the thresholds (TRPA 2001), including the proposed project.

TRPA Threshold Carrying Capacities

TRPA thresholds are standards or environmental quality targets to be achieved in the Tahoe Basin. TRPA cannot approve projects that would cause a significant adverse effect on a threshold area without appropriate mitigation. The thresholds discussed below were adopted by TRPA in 2002. TRPA conducts a comprehensive evaluation of all thresholds every 5 years. In 2007 TRPA released to the public the *April 2007 Threshold Update Environmental Assessment (EA)* and the *2006 Draft Threshold Evaluation Report*. The EA evaluates the proposal to revise some of the existing environmental thresholds while the Draft Threshold Evaluation Report presents the results of the evaluation of the 1982 Thresholds and recommends adjustments to the existing thresholds based on the results of the evaluation and on input from the Pathway process. In September of 2007, TRPA issued the environmental threshold report and threshold environmental compliance forms were approved by the TRPA Governing Board. Those applicable to the study area are discussed below.

SR-1 Travel Route Ratings

The TRPA travel route rating threshold tracks long-term cumulative changes to views seen from Federal and State highways in urban, transitional, and natural landscapes in the region and to the views seen from Lake Tahoe looking toward the shore. Roadways have been divided into 53 travel segments (called "roadway travel units"), each representing a continuous two-directional viewshed of similar visual character. Lake Tahoe's shoreline is divided into 33 separate "shoreline travel units." Roadway Travel Route ratings use the following six threshold criteria to evaluate each unit:

1. Human-made features along roadways and shoreline
2. Physical distractions to driving along roadways
3. Roadway characteristics
4. Views of the lake from roadways
5. General landscape views from roadways and shoreline
6. Variety of scenery from roadways and shoreline

The only travel unit with views of the study area is Roadway Travel Unit 36B, which includes U.S. 50. The 2006 Threshold Evaluation Report determined that this area is in attainment. Areas that are in attainment are required to maintain the scenic quality of the area; nonattainment areas are required to implement projects to improve scenic quality.

SR-2 Scenic Quality Ratings

The purpose of the TRPA scenic quality threshold is to maintain or enhance views of individual existing scenic resources. The scenic resources in the region include the views of the natural landscape and distinctive natural features that were identified, mapped, described, and evaluated as part of the 1982 Scenic Resource Evaluation. The subcomponents that make up the scenic resources are:

- foreground, middle-ground, and background views of the natural landscape from roadways;
- views to Lake Tahoe from roadways;
- views of Lake Tahoe and natural landscape from roadway entry points into the region;
- unique landscape features, such as streams, beaches, and rock formations that add interest and variety, as seen from roadways;
- views of the shoreline, the water's edge, and the foreground as seen from the lake;
- views of the backdrop landscape, including the skyline, as seen from the lake; and
- visual features seen from the lake that are points of particular visual interest on or near the shore.

Numerical scenic quality ratings are derived for each mapped scenic resource, using four visual indicators—unity, vividness, variety, and intactness—as subcomponents of the composite rating. According to the TRPA 2006 Threshold Evaluation Report, unity is the degree to which the visual resources of a scene join together to form a single, coherent, harmonious unit. Vividness is a measure of contrasting elements, such as color, line, and shape, marked differences seen as related, or repetition of similarities—sometimes referred to as distinctiveness. Variety is numerous or different parts seen together and can be referred to as richness. Intactness describes the degree to which a landscape retains its natural condition, or the degree to which modifications emphasize or enhance the natural condition of the landscape.

These four indicators are each rated on a scale from zero (absent) to three (high). The ratings for all four indicators are summed to yield the scenic quality threshold rating described below. Each resource is defined by the length of the resource and the areas seen from that unit.

SR-3 Public Recreation Area Scenic Quality Thresholds

The TRPA public recreation area scenic quality threshold applies to specific public recreation areas, including beaches, campgrounds, ski areas, and segments of Class I and Class II bicycle trails. Public recreation areas with views of scenic resources are valuable because they are major public gathering places, hold high scenic values, and are places where people are static (compared to people on the travel routes) and have more time to focus their attention on the views and scenic resources. Scenic resources as seen from the public recreation areas are composed of the following subcomponents:

- Views of the lake and natural landscape from the recreation area
- Views of natural features in the recreation area
- Views of human-made features in or adjacent to the recreation area that influence the viewing experience

TRPA's 1993 Lake Tahoe Scenic Resource Evaluation did not identify any TRPA-designated public recreation areas with views of the study area. Neither Lake Valley SRA nor Washoe Meadows SP is designated by TRPA as a public recreation area subject to these thresholds. The public recreation area nearest to the study area is Heavenly Valley Ski Resort. The study area is located approximately 7 miles from the ski resort. Based on this evaluation, the study area would not be visible from any TRPA-identified public campgrounds or segments of TRPA-identified bike trails.

SR-4 Community Design

The community design threshold is a policy statement that applies to the built environment and is not restricted to roadways or shoreline units. Design standards and guidelines found in the Code of Ordinances, the Scenic Quality Improvement Program, and in the adopted Community Plans provide specific implementation direction. To secure threshold attainment, design standards and guidelines must be widely implemented to improve travel route ratings and produce built environments compatible with the natural, scenic, and recreational values of the region. The visual quality of the built environment has also become an issue of increasing importance to residents, local businesses, and community leaders.

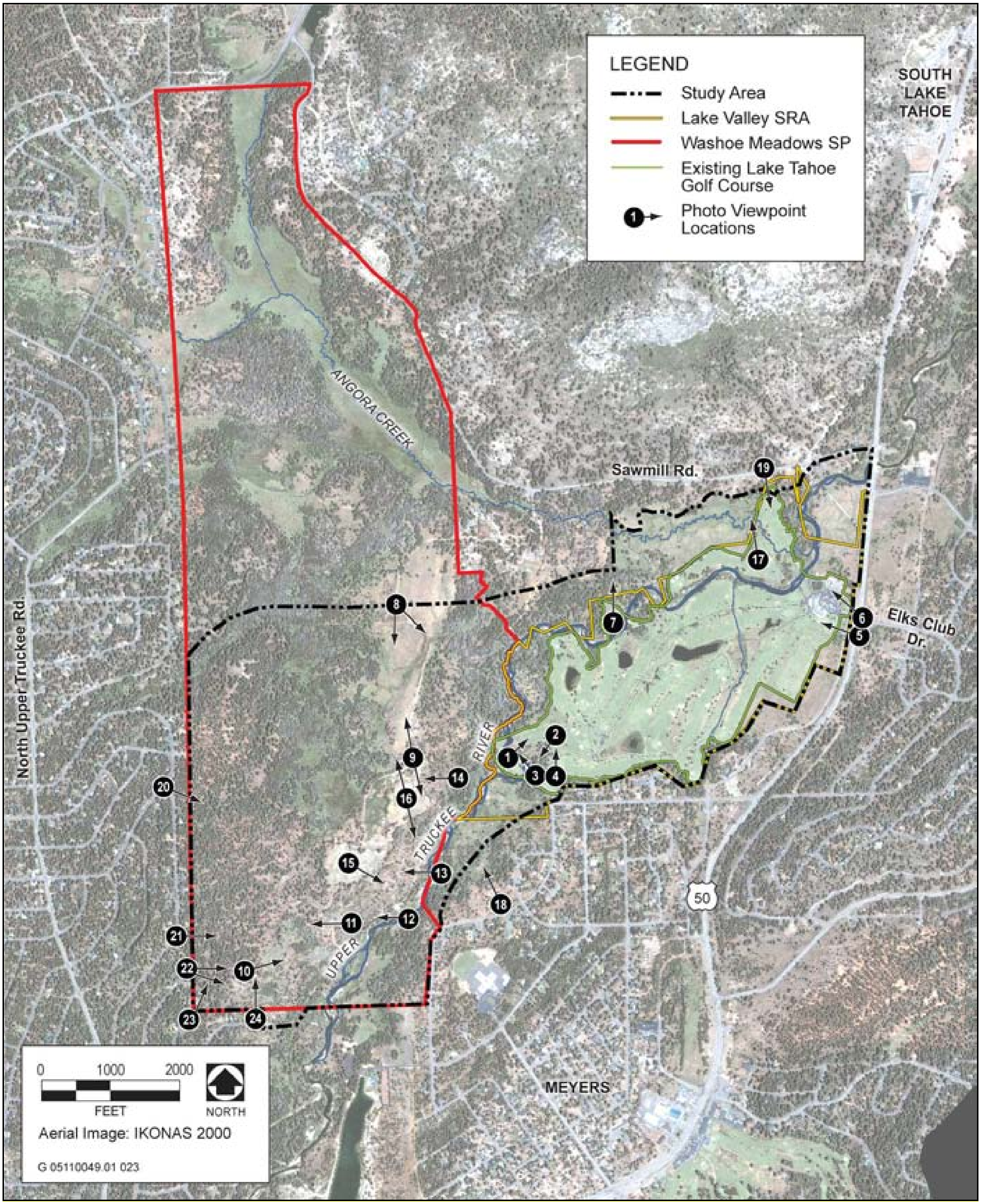
AFFECTED ENVIRONMENT

VISUAL CHARACTER OF THE STUDY AREA

A map showing representative key viewpoints with views toward and within the study area is shown in Exhibit 3.7-1. Photographs of these viewpoints are shown in Exhibits 3.7-2 through 3.7-25.

The eastern half of the study area consists of the Lake Valley SRA, which includes the Lake Tahoe Golf Course and a portion of the Upper Truckee River that runs through the golf course (Exhibit 3.7-2). Visual attributes of the golf course include mowed greens, golf course holes, sand traps, and small bridges that cross the river in several locations (Exhibit 3.7-3). Golf course greens extend to the river's edge in most areas, and in numerous areas along this reach of the river, the riverbank is unvegetated with exposed dirt and rock (Exhibit 3.7-4). At many of these locations environmental bank protection materials, such as logs, root wads, and rock have been placed along the bank to reduce erosion (Exhibit 3.7-5). Areas surrounding the golf course greens are forested, and some large trees and groupings of trees are interspersed throughout the golf course. A driving range, clubhouse, and parking lot are located on the northeastern edge of the golf course, adjacent to U.S. 50 (Exhibits 3.7-6 and 3.7-7). The parking lot and buildings for the golf course are existing sources of light and glare (State Parks 1988: 32).

The western half of the study area consists of Washoe Meadows SP, which occupies approximately 620 acres of open meadow, woodland, forested areas, as well as some visually degraded areas (i.e., former quarries), (Exhibit 3.7-8). Washoe Meadows SP is primarily forested, with stands of lodgepole and Jeffrey pine trees. A section of the Upper Truckee River runs through the southeast corner of the park. This section of the river has low-lying riparian vegetation along the banks, which has resulted in fewer exposed banks and less erosion than along the golf course reach of the river. A municipal sewer and associated gravel access road run north to south through the eastern portion of the park. Although the park has not been developed, it is used for numerous informal, dispersed recreation activities and includes unmaintained volunteer trails throughout the park. These trails provide views of the existing golf course, forest, the Upper Truckee River, and other habitats within Washoe Meadows SP (Exhibits 3.7-9 through 3.7-16). Near the center of Washoe Meadows SP is a fen that stays wet year-round. Just southeast of the fen are two large open areas and several smaller areas that were once visually degraded sand and gravel quarries (Exhibit 3.7-17). One of these areas has been filled, recontoured, and revegetated; the other quarry areas are still in a degraded condition visible in the landscape.



Source: EDAW (now AECOM) 2008

Study Area Viewpoints **Exhibit 3.7-1**

Source: Photograph taken by EDAW (now AECOM) in 2006

Views to the Northeast of River in Foreground and Golf Course in Middleground (Viewpoint 1) **Exhibit 3.7-2**

Source: Photograph taken by EDAW (now AECOM) in 2006

Golf Course Bridge across the Upper Truckee River with Adjacent Bank Protection (Viewpoint 2) **Exhibit 3.7-3**

Source: Photograph taken by EDAW (now AECOM) in 2006

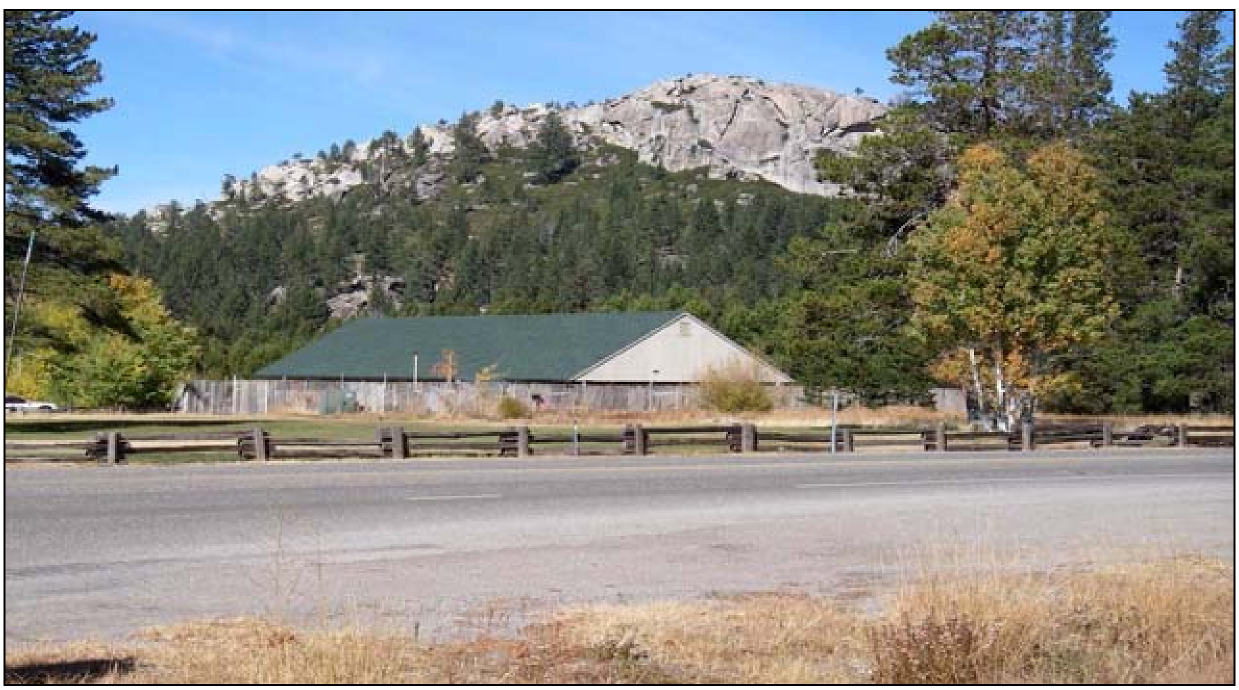
Eroding Riverbank along the Upper Truckee River with Adjacent Golf Fairway (Viewpoint 3) **Exhibit 3.7-4**

Source: Photograph taken by EDAW (now AECOM) in 2006

Environmental Bank Protection along the Upper Truckee River (Viewpoint 4) **Exhibit 3.7-5**

Source: Photograph taken by EDAW (now AECOM) in 2006

View of the Golf Course Entrance, Clubhouse, and Driving Range from U.S. 50 (Viewpoint 5) **Exhibit 3.7-6**



Source: Photograph taken by EDAW (now AECOM) in 2006

View of Golf Course Maintenance Building from U.S. 50 (Viewpoint 6) **Exhibit 3.7-7**

Source: Photograph taken by EDAW (now AECOM) in 2006

View to the East from the Golf Course (Viewpoint 7) **Exhibit 3.7-8**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the Southeast from Trail within Washoe Meadows State Park (Viewpoint 8) **Exhibit 3.7-9**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the South from Trail within Washoe Meadows State Park (Viewpoint 8) **Exhibit 3.7-10**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the North from Trail within Washoe Meadows State Park (Viewpoint 9) **Exhibit 3.7-11**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the South from Trail within Washoe Meadows State Park (Viewpoint 9) **Exhibit 3.7-12**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the East from within Washoe Meadows State Park (Viewpoint 10) **Exhibit 3.7-13**

Source: Photograph taken by EDAW (now AECOM) in 2006

Fen in Washoe Meadows State Park (Viewpoint 11) **Exhibit 3.7-14**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the West of Upper Truckee River from Bakersfield Trailhead (Viewpoint 12) **Exhibit 3.7-15**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the West of Upper Truckee River from North of Bakersfield Trailhead (Viewpoint 13) **Exhibit 3.7-16**

Source: Photograph taken by EDAW (now AECOM) in 2006

North Lobe of the Former Quarry Site in Washoe Meadows State Park (Viewpoint 14) **Exhibit 3.7-17**

Source: Photo taken by State Parks in 2006

South Lobe of the Former Quarry Site in Washoe Meadows State Park (Viewpoint 15) **Exhibit 3.7-18**

Source: Photo taken by State Parks in 2007

North Lobe of the Former Quarry Site in Washoe Meadows State Park (Viewpoint 16) **Exhibit 3.7-19**

Source: Photo taken by State Parks in 2007

North Lobe of the Former Quarry Site in Washoe Meadows State Park (Viewpoint 16) **Exhibit 3.7-20**

Source: Photo taken by State Parks in 2008

Existing Golf Course near Hole 11 and Angora Creek (Viewpoint 17) **Exhibit 3.7-21**

VISUAL CHARACTER OF THE SURROUNDING ENVIRONMENT

The Tahoe Basin is renowned for its natural beauty. The scenic resources of the surrounding area are enjoyed as a backdrop for visitors using the Lake Valley SRA and Washoe Meadows SP. Rugged peaks, a river with perennial flow, meadows, and forested slopes characterize the scenery (Exhibit 3.7-8). The Lake Tahoe Airport lies approximately 1 mile northeast of the study area, and airplanes regularly pass nearby. Residential areas and/or U.S. 50 are visible from most portions of the golf course. Views of the surrounding area from the Washoe Meadows portion of the study area are sometimes screened or obscured, because of the stands of pines that cover the park. However, current forest management in the Basin is focused on reducing fuels in the urban interface, often removing 50% of trees or more, with the long term goal of maintaining open canopy, low-density forest. These practices occur throughout Washoe Meadows SP. Sewer line manholes and power lines that serve nearby residential areas run along portions of the Upper Truckee River and U.S. 50, respectively, and are visible from the study area (State Parks 1988: 32).

North of the Lake Valley SRA portion of the study area are Sawmill Road, stands of pine trees, and rugged mountain peaks. The area east and south of the Lake Valley SRA includes residences, U.S. 50, and mountain peaks. The area to the west of the Lake Valley SRA is Washoe Meadows SP, which is forested. North of the Washoe Meadows SP portion of the study area are Lake Tahoe Boulevard and forest. East of Washoe Meadows SP are the golf course, forest, and rugged peaks, and to the northeast are residences. Residences, forest, and Lake Baron lie to the south of Washoe Meadows SP, and residences border the entire western edge of the park.

VIEWS FROM THE STUDY AREA

Views from the study area to the north include forest vegetation in the foreground, and in the background, rugged forested and granite mountain peaks. Intervening vegetation obscures most views of Sawmill Road from the golf course. Views to the east include the golf course greens, the driving range, and the river with existing golf cart bridges in the foreground and the clubhouse and intermittent views of U.S. 50 in the background. To the south views include the golf course and several single family homes adjacent to the golf course in the foreground and forest in the background. Views to the west consist of forest. Intervening vegetation and tall stands of pine trees preclude views of the residences to the west, except along the westernmost boundary of Washoe Meadows SP.

VIEWS OF THE STUDY AREA

The visually prominent features of the study area include the golf course, clubhouse and maintenance buildings, and parking lot, as well as the forested area of Washoe Meadows SP. The driving range, clubhouse, maintenance building, and parking lot are all visible from U.S. 50. Views of Washoe Meadows SP from the western side of the property (next to adjacent residential properties) looking eastward consist of forest with scattered, small open areas. Views of the study area from the north include tall stands of pine trees and dense vegetation and open areas. Views of the study area from the south include dense forest and intermittent views of the golf course. Several residences along the south edge of the SRA in the community of Meyers have direct views of the golf course. Travelers on Sawmill Road also have intermittent views of the golf course. Views to the south from Sawmill Road include views of forest and Angora Creek in the foreground, golf course greens in the middle-ground, and mountain peaks in the background (Exhibit 3.7-19).

The Washoe Meadows SP portion of the study area is visible from portions of two-lane residential roads within the North Upper Truckee neighborhood to the west of the park. Portions of Washoe Meadows SP can also be viewed from some residences to the west of the park. Views of dense forest, intervening vegetation, and nearby residences obscure most views of the interior of Washoe Meadows SP and completely obscure views of the existing golf course (Exhibits 3.7-20 and 3.7-25). There are also some intermittent views of distant mountain peaks and open areas within Washoe Meadows SP from some residential roads in this area. The southeast portion of Washoe Meadows SP is also visible from residences on Bakersfield Street. These residences have views of forest and in some locations views of the Upper Truckee River corridor (Exhibit 3.7-18).

Source: Photograph taken by EDAW (now AECOM) in 2008

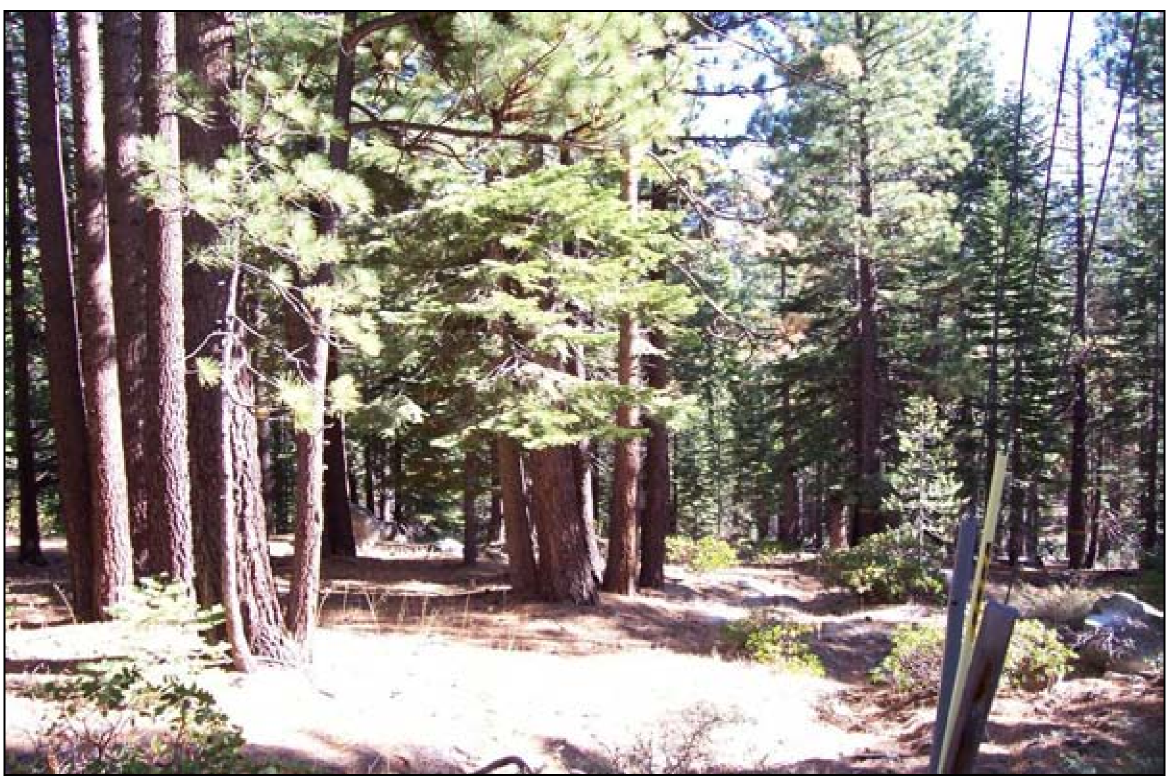
View to the Northwest of Washoe Meadows State Park from Bakersfield Street at Blue Jay Circle (Viewpoint 18) **Exhibit 3.7-22**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the South of Golf Course from Sawmill Road (Viewpoint 19) **Exhibit 3.7-23**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the Southeast of Washoe Meadows State Park from Delaware Street (Viewpoint 20) **Exhibit 3.7-24**

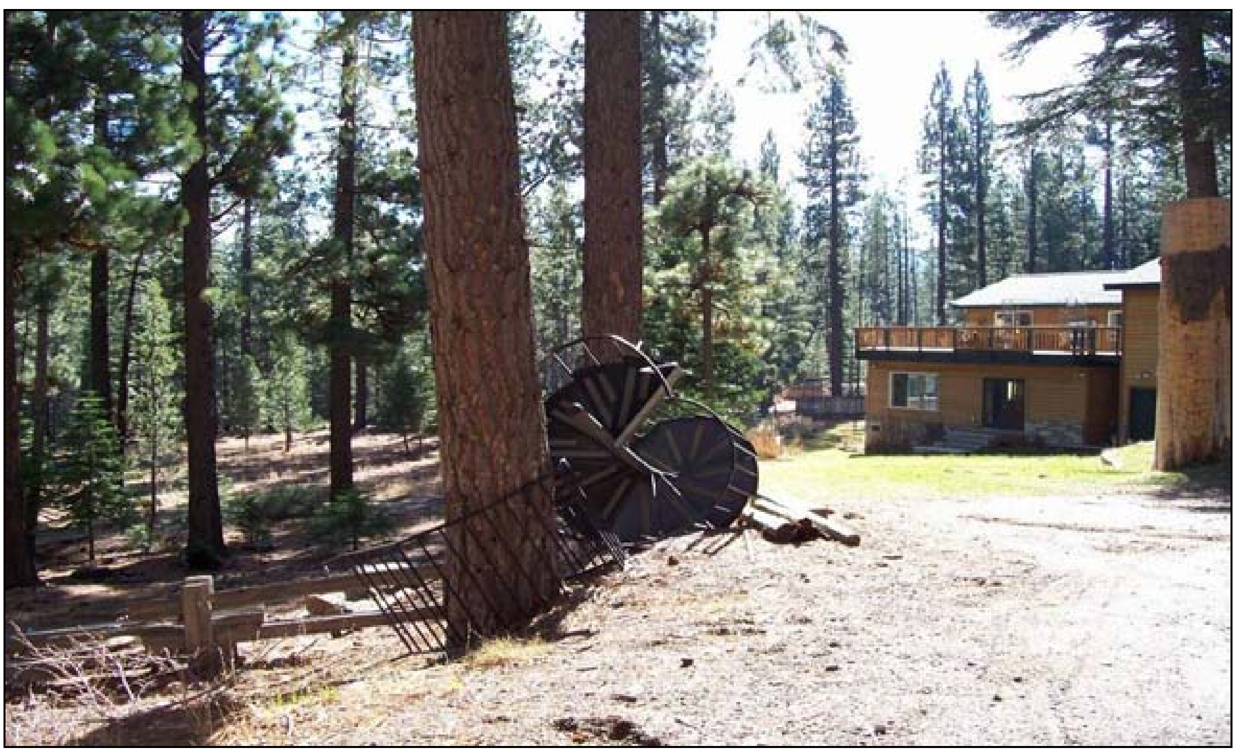


Source: Photograph taken by EDAW (now AECOM) in 2008

View to the East of Washoe Meadows State Park from Delaware Street (Viewpoint 21) **Exhibit 3.7-25**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the East of Washoe Meadows State Park from Normuk Street (Viewpoint 22) **Exhibit 3.7-26**



Source: Photograph taken by EDAW (now AECOM) in 2008

View to the Southeast of Washoe Meadows State Park from Normuk Street (Viewpoint 23) **Exhibit 3.7-27**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the Northeast of Washoe Meadows State Park from Ulmeca Street (Viewpoint 24) **Exhibit 3.7-28**

Source: Photograph taken by EDAW (now AECOM) in 2008

View to the North of Washoe Meadows State Park from Chilicothe Street (Viewpoint 25) **Exhibit 3.7-29**

Scenic Ratings of the Study Area and Vicinity

Roadway Travel Unit Ratings

TRPA's Roadway Travel Unit 36B includes the approximately 1.7-mile view corridor along U.S. 50 that extends from the southern boundary of the industrial development along the highway (e.g., the airport, concrete plant, and other repair and storage uses) to the intersection of U.S. 50 and Pioneer Trail. This unit contains moderately rolling terrain, with little development along its length, and has distinctive views to the distant ridge and middle-ground rock formations at the Lake Valley SRA. This unit also offers views of the Upper Truckee River and its associated riparian zone. The unit has a rating of 20 and is currently in attainment, according to the 2006 Threshold Evaluation Report (TRPA 2007). Scenic improvements are required for Roadway Travel Units rated at 15 or below. Between the 1996 and 2006 threshold evaluations the scenic quality of the roadway travel unit was considerably improved resulting from reduced intrusions by human-made features and roadway distractions. Billboards along the highway were removed during this period. Table 3.7-1 shows the Roadway Travel Unit ratings and the threshold criteria for Roadway Travel Unit 36B.

Table 3.7-1
Travel Route Ratings: Adopted and Existing

Categories	Rating [a]	
	1996[b]	2006
Roadway Travel Unit 36B[c]		
Man-made Features	2	3
Roadway Distractions	2.5	4.5
Road Structure	3	3.5
Lake Views	1	1
Landscape Views	3	4
Variety	3	4
Roadway Unit Total	**14.5**	**20**

[a] Visual Quality Rating: (1) low, (2) moderate, (3) high.
[b] The 1996 scenic rating was a composite of Roadway Travel Units 36A, 36B, and 36C.
[c] Attainment Value: Roadway Units (15).
Source: TRPA 2007: Appendix 1:13

Scenic Quality Ratings

TRPA's 1982 Scenic Resource Inventory identifies views of the golf course as Roadway Scenic Resource 36-3, a visual feature in Roadway Travel Unit 36. It is described as follows: "Tahoe Golf Course with low lying forest and rocky outcrop of Twin Peaks to the northwest; distant views of peaks (Echo and Angora) to west. Forested mountains are seen in middle ground to the east." The Scenic Resource Inventory also identifies forest and river corridor views as visual features. Roadway Scenic Resource 36-7 is described as "foreground views of pine forest and scattered residential/commercial development" and Roadway Scenic Resource 36-5 is described as "Truckee River stream zone." All of these scenic resources are within the project vicinity.

Scenic Quality Thresholds for Public Recreation Areas

TRPA's 1993 Lake Tahoe Scenic Resource Evaluation did not identify sensitive lake views within the study area, nor did it identify any TRPA-designated public recreation areas with views of the study area. The nearest TRPA-designated public recreation area is Heavenly Valley Ski Resort approximately 7 miles to the northeast; the study area would not be visible from this ski area because of distance, intervening vegetation, and intervening structures (Wagstaff and Brady 1993:341–342).

3.7.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; observations of the study area landscape; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, effects on environmental threshold carrying capacities (thresholds) of the Tahoe Regional Planning Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.5, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, a scenic resources impact is considered significant if implementation of the proposed project would do any of the following:

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway;
- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on scenic resources if it would:

- substantially degrade views from any Federal or State highway, Roadway Travel Unit, or the surrounding area;
- substantially degrade views from any public recreation area or TRPA-designated bicycle trail;
- block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area;
- be inconsistent with the height and design standards required by the applicable ordinance or community plan;

- be inconsistent with the TRPA SQIP or design review guidelines;
- include substantial new or modified sources of lighting;
- cause light from exterior sources to be cast off-site or onto public lands; or
- create new sources of glare through the siting of the improvements or through the use of reflective materials.

METHODS AND ASSUMPTIONS

The scenic quality of an area is determined through the variety and contrasts of the area's visual features, the character of those features, and the scope and scale of the scene. The aesthetic quality of an area depends on the relationships between its features and their importance in the overall view. Evaluating scenic resources requires a method that objectively characterizes visual features, assesses their quality in relation to the visual character of the surrounding area, and identifies their importance to the individuals viewing them. This process is derived from established Federal procedures for visual assessment and is commonly used for a variety of project types.

Both natural and created features in a landscape contribute to its perceived visual quality. Landscape characteristics influencing visual quality include geologic, hydrologic, botanical, wildlife, recreation, and urban features. Several sets of criteria have been developed for defining and evaluating visual quality. A commonly used set of criteria includes the concepts of vividness, intactness, and unity. None of these is itself equivalent to visual quality; all three must be high to indicate high quality. These terms are defined as follows (FHWA 1983:6):

- "Vividness" is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- "Intactness" is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements.
- "Unity" is the visual coherence and compositional harmony of the landscape considered as a whole.

The analysis of this study uses a qualitative descriptive method for characterizing and evaluating the visual resources of the areas that could be affected by the proposed project. The quality of views of areas that could be affected by the proposed project and alternatives is evaluated based on the relative degree of vividness, intactness, and unity apparent in views and also on viewer sensitivity. Viewer sensitivity is a function of several factors:

- visibility of the landscape,
- proximity of viewers to the visual resources,
- frequency and duration of views,
- number of viewers,
- types of individuals and groups of viewers, and
- viewers' expectations.

The sensitivity of a view of the landscape is also determined by the extent of the public's concern for a particular view. Areas of high visual sensitivity are highly visible to the general public. Scenic highways, tourist routes, and recreation areas are considered more visually sensitive than more urbanized locations. A determination finding that a potential visual impact has significance would be based on a change in visual character as determined by the obstruction of a public view, creation of an aesthetically offensive public view, or adverse changes to objects having aesthetic significance. A view's distance from landscape elements plays an important role in the determination of an area's visual quality. Landscape elements are considered higher or lower in visual importance based on their position relative to the viewer. Generally, the closer a resource is to the viewer, the more dominant, and, therefore, the more visually important, it is to the viewer.

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

TRPA-designated public recreation area or bicycle trail—Based on the 1993 TRPA scenic evaluation there are no TRPA-designated public recreation areas or bicycle trails with views of the study area. There is no current update to the 1993 scenic inventory. The Sawmill bike trail is considered a designated Class I Shared Use Path but has not been added to the list of scenic bikeways. Since the trail is immediately adjacent to U.S. Highway 50, scenic impacts on the bike path are addressed through scenic corridor impacts discussions below.

Views of Lake Tahoe—The study area is not visible from Lake Tahoe and does not provide any views of Lake Tahoe. Therefore, this topic will not be discussed further.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.7-1 (Alt. 1)	**Potential for Short-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *The study area is within view from U.S. 50, which is a designated State scenic highway and is within Roadway Travel Unit 36B. No short-term construction activities would be associated with Alternative 1 that would result in short-term changes in views from U.S. 50 or the surrounding area; therefore, this impact would be **less than significant**.*

Under Alternative 1, existing conditions in the study area would continue into the future. The reach of the Upper Truckee River within the study area would not be restored and would continue to erode and transport sediment to Lake Tahoe, and the 18-hole regulation golf course would remain as it currently exists, and views of the golf course would remain unchanged. Repairs to the river and golf course would continue on an emergency or as-needed basis, as has occurred in the recent past. There would be short-term construction-related changes in views associated with future repairs to the river and golf course; however, these changes would be temporary and minor. There would be no changes to Washoe Meadows SP.

Because Alternative 1 would not include any new facilities or changes to existing facilities and short-term construction activities associated with this alternative would be temporary and minor, there would be no substantial short-term changes in views from Roadway Travel Unit 36B, U.S. 50, or the surrounding area under Alternative 1. This impact would be less than significant.

No mitigation is required.

IMPACT 3.7-2 (Alt. 1)	**Potential for Long-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *No new facilities are proposed under Alternative 1; however, there could be minor changes in long-term views associated with repairs to the river or golf course. These modifications are not expected to change views from Roadway Travel Unit 36B or U.S. 50. Therefore, this impact would be **less than significant**.*

As discussed above for Impact 3.7-1 (Alt. 1), Alternative 1 would not include any new permanent facilities or long-term changes in views associated with new or modified facilities. However, repairs to existing bank stabilization sites and infrastructure and additional spot stabilization may occur in response to erosion, other damage, or failure, as they do today, which could result in long-term changes of the visual character of the river as viewed from within the golf course or surrounding areas. These changes would be a continuation of existing river stabilization activities and are expected to be minor. In addition, these changes are not expected to change views from Roadway Travel Unit 36B or U.S. 50. Therefore, there would be no substantial long-term changes in views or the visual character of the area. This impact would be less than significant.

No mitigation is required.

IMPACT 3.7-3 (Alt. 1)

Potential for Increases in Light or Glare. *No new sources of light or glare would be introduced as part of Alternative 1.* ***No impact*** *would occur.*

Alternative 1 would not include any nighttime construction or new facilities that would introduce any new short-term or long-term sources of light or glare. Thus, light and glare in the study area would not change as a result of Alternative 1. No impact would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.7-1 (Alt. 2)

Potential for Short-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B. *Construction activities within the study area may be visible from U.S. 50, the existing golf course, and trails within Washoe Meadows SP and may be visible or partially visible from adjacent residential neighborhoods. In addition, construction vehicles and equipment would travel on U.S. 50, which is designated as a scenic highway. Because construction-related scenic effects would be temporary and limited to the visibility of typical construction vehicles and ground-level activities, this impact would be* ***less than significant****.*

Implementation of Alternative 2 would include construction activities associated with relocating golf course holes to the west side of the river within Washoe Meadows SP, restoration of the river and floodplain, removal of existing golf course bridges and addition of one replacement bridge, tree removal, and paving the grassy area at the golf course entrance. Construction would take place between May 1 and October 15 (possibly November 1 if weather allows and an extension is granted) of each year for a 3- to 4-year period. During these construction windows, heavy equipment and associated vehicles, construction workers, staging areas, and construction activities would be visible or partially visible from surrounding areas. Under this alternative, there would be up to 12 staging areas; however, these would primarily be in previously disturbed areas.

Roadway Travel Unit 36B includes the approximately 1.7-mile view corridor along U.S. 50 that has views of the study area. This unit has a rating of 20 and is currently in attainment, according to the 2006 Threshold Evaluation Report (TRPA 2007). Construction activities associated with relocating a portion of the golf course and paving the unpaved parking area at the golf course entrance would be visible from U.S. 50. In addition, large construction vehicles and equipment would use U.S. 50 as a travel route to and from the study area, which could degrade views along the highway. There would also be short-term views of construction staging areas from U.S. 50: one adjacent to the existing golf course parking area and one within the existing driving range. Views of staging areas would include views of construction equipment, materials, and vehicles. Although construction of this alternative could cause changes in views for travelers on U.S. 50, these changes would be temporary and not substantial (i.e., visible construction vehicles and ground-level activity, but no tall, prominent, or long-term construction features). Thus, construction activities would not substantially degrade views from Roadway Travel Unit 36B or U.S. 50.

Construction activities and staging areas would also be visible to golfers, trail users, and adjacent neighborhoods. These activities would include paving near the entrance of the golf course, relocating golf course holes to the west side of the river and removing associated trees, and making widespread river modifications, including removing and replacing a bridge. All viewer groups would be affected by this change in visual quality, although the effect would vary in degree depending on the viewer location and sensitivity. Although construction of Alternative 2 could cause some changes in views from U.S. 50 and surrounding areas, these changes would be temporary and minor. Construction activities would also be intermittent and would occur only during the designated work periods. This impact would be less than significant.

No mitigation is required.

IMPACT 3.7-2 (Alt. 2) **Potential for Long-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *There would be long-term changes in views of the golf course in the current Washoe Meadows SP and unpaved parking area. The unpaved parking area changes would be visible from U.S. 50 under Alternative 2.Alternative 2 would include removal of trees and reconfiguration of golf course holes that would change views for trail users within Washoe Meadows SP and for residents south and west of Washoe Meadows SP. Although changes in views from U.S. 50 would be minor and would not degrade long-term views, changes in views from surrounding neighborhoods and trails could be substantial. Therefore, this impact would be* ***significant****.*

Under Alternative 2, golf course holes would be relocated to the west side of the river within Washoe Meadows SP, requiring substantial grading and tree removal; the area along the river previously occupied by golf course would be restored; and the unpaved parking area north of the golf course entrance would be converted to a paved parking area. These activities would result in visual changes to both the eastern and western portions of the study area. Paving of the unpaved parking area would be visible from U.S. 50.

Eastern Area – Lake Valley SRA

Under Alternative 2, there would be long-term changes in views of the golf course, some of which would be visible from U.S. 50. Several golf course holes currently located along the river would be relocated to the west side of the river, and the area adjacent to the river would be restored. All five of the existing bridges across the river would also be removed under this alternative and replaced with one longer span bridge. There would be brief views of this area from U.S. 50 that would change from golf course greens to native landscape. However, changes in long-term views from U.S. 50 associated with relocating golf course holes would be minimal and are not considered adverse because native riparian landscape would be restored and views of these modifications would be limited by intervening vegetation, topography, and structures (i.e., the clubhouse). Minor changes along the unnamed creek that is visible from U.S. 50, including a larger buffer between the creek and the golf turf, would occur. There would be no other changes to the golf course holes immediately adjacent to U.S. 50. The golf course holes that would be relocated to the west side of the river within Washoe Meadows SP would not be visible from U.S. 50 because of intervening neighborhoods, topography, and tall, dense vegetation.

Paving of the unpaved parking area would also cause a change in views from U.S. 50. There are currently 115 parking spaces in the paved parking lot at the golf course. The grassy areas on both sides of the golf course entrance are currently used for parking, and under Alternative 2, the north unpaved area would be paved to create an additional 89 parking spaces. Changes in long-term views associated with paving of the unpaved parking area would be less than significant, because the change in appearance of the parking area would be on the ground plane and would not substantially alter the overall landscape view. Also, there is no change in the visible activity (current parking use would continue) and no substantial increase in the anticipated parking use under this alternative. Although the grassy area would change from grass to pavement, the change in views would not be intrusive, being at the ground level. In addition, no changes to the clubhouse, driving range, or maintenance buildings, which are prominent features visible from U.S. 50, are proposed. Therefore, implementing Alternative 2 would not result in substantial changes in long-term views from U.S. 50.

Existing views of the golf course from the eastern portion of the study area include mowed greens, golf course holes, sand traps, and small bridges that cross the river in several locations. Golf course greens extend to the river's edge in most areas, and in numerous areas along this reach of the river, the riverbank is unvegetated with exposed dirt and rock. Under Alternative 2, views adjacent to the river would change from golf course greens to a native landscape, including riparian, floodplain, and wetland habitats. These changes in views would primarily be visible to golfers from within the existing golf course; however, there may also be distant views from the adjacent neighborhoods surrounding the golf course. Views of natural landscapes are considered desirable, and this change in views is not considered adverse. Therefore, changes in views of the eastern portion of the study area would not substantially degrade views from any scenic vistas or any sensitive viewpoints (i.e., surrounding neighborhoods).

Because there would be no substantial changes to the long-term views from U.S. 50 or the eastern portion of the study area, this impact would be less than significant.

Western Area – Washoe Meadows SP

The most substantial changes in views under Alternative 2 would occur within Washoe Meadows SP in the western portion of the study area. Within the western portion of the study area, existing views from around and within the study area are primarily of forest, with stands of lodgepole and Jeffrey pine trees, and some visually degraded areas (i.e., former quarries). Current forest management practices within this area include reducing fuels in the urban interface, often removing 50% of trees or more in some areas with the long term goal of maintaining an open canopy and low-density forest. These management actions open the viewscape adjacent to residences.

Under Alternative 2, approximately 1,640 trees would be removed, changing the views from points within the park unit from forested to more open views of golf course tees, fairways, greens, bunkers, cart paths, and a restroom near hole 9. Interspersed existing trees would be retained. The golf course layout was designed to minimize tree loss by placement in relatively open and previously disturbed areas. All trees would be removed from areas designated as tees, greens, and fairways and approximately 80% would be removed from areas designated as rough. However, it is anticipated that the layout for the relocated holes would result in removal of three trees greater than 30 inches dbh. Introduction of golf course holes to this area would further change the views from more natural landscape and disturbed areas of bare ground to golf course greens. The restroom facility would be small, designed with natural colors to blend in with the surrounding landscape, and blocked from view with strategically placed vegetative cover. During times of the year when the surrounding natural vegetation is green, the views of golf course greens would be less noticeable; however, views of the golf course may be more pronounced during times of the year when the surrounding natural vegetation naturally dries and turns brown and the golf course remains green.

A forested buffer between 200 and 400 feet wide would remain intact between all existing houses and the relocated golf course holes that would partially or completely obscure views of the golf course; however, partial views of the relocated golf course holes may exist through the forested buffers in areas where existing trees are less dense or where existing open areas in the forest are located. Residences that may experience a change in views are located in the North Upper Truckee neighborhood, primarily on Chilicothe Street, Normuk Street, and Delaware Street. Existing views from these locations are shown in Exhibits 3.7-24 through 3.7-27 and 3.7-29.

In addition, under Alternative 2, there would be a substantial change in views from existing trails within Washoe Meadows SP. Although these trails are not officially established or designated trails, they are used regularly by resident and visiting recreationists. These trails provide views of the existing golf course and views of forest, the Upper Truckee River, and other habitats within Washoe Meadows SP (Exhibits 3.7-9 through 3.7-16). These views would also change from dense forest to more open views and golf course tees, fairways, greens, bunkers, and cart paths in some areas.

Both viewer groups (i.e., residents on their properties and trail users) would be affected by this change in landscape appearance, although the effect would vary in degree depending on the viewer location and sensitivity. Determination of visual quality is subjective and may differ from one individual to another. Some viewers may consider views of forested areas to be of higher value than views of golf course greens, while others may consider views of golf course greens to have a higher value. For purposes of environmental analysis under CEQA, NEPA, and TRPA requirements, the natural landscape possesses the scenic values that warrant protection.

Preserving the visual quality of the landscape is a key design goal for the relocated golf course. Although there would be substantial tree removal, the golf course layout was designed to minimize this effect by maximizing placement in existing, relatively open and previously disturbed areas that would have the least effect on the landscape. This portion of the golf course would also be designed so that maintained turf areas are surrounded by native vegetation to maintain a natural-looking landscape to the extent possible. The intent is to create a course that blends well with existing terrain and natural vegetation. In addition, grading would be minimized; the natural contour would be used to the extent possible.

Although visual quality is a key design goal for the golf course, this alternative would require substantial grading to modify the terrain for the golf holes, substantial removal of existing trees, and construction of golf facilities in the existing forest. This would result in a substantial change in views from existing trails, and potentially from limited vantage points in adjacent neighborhoods (where the intervening forest buffer is not sufficiently dense to block views). This impact would be significant.

Mitigation Measure 3.7-2 (Alt. 2): Prepare and Implement a Landscaping and Forest Management Plan.

To address the degradation of visual quality resulting from tree removal and construction of the golf course in Washoe Meadows SP, State Parks will prepare and implement a landscaping and forest management plan to maximize visual screening of the golf course, while balancing vegetation management with other resource objectives, including habitat quality and fire fuel management. State Parks will plant native vegetation that contributes to visual screening around the perimeter of the golf course footprint consistent with the surrounding natural landscape. Plantings will be undertaken between May 1 and October 15 and will include regular watering in the growing season of the first three years to ensure adequate initial growth. The plantings will provide screening to mitigate the increased visibility of the golf course from surrounding neighborhoods and trails.

The plan will include information on species used for plantings, implementation approach and timing, irrigation, monitoring, and adaptive management. The plan will also require that trees be removed in a staggered pattern to the extent feasible to maximize the visual screening by the remaining trees. The buffer landscape will also be managed to maintain a minimum depth of 200 feet between residential properties and the golf course. The forest vegetation in the buffer will be managed to maintain an effective visual screen, appropriate fire fuel control, and wildlife habitat qualities. The plan will be prepared in conjunction with detailed golf course design so that precise areas of disturbance are known and the landscaping and forest management process can be coordinated with golf course construction.

Implementation of this mitigation measure would reduce impacts associated with the long-term degradation of the visual character, existing visual quality, or scenic quality affecting residences adjacent to Washoe Meadows SP to a less-than-significant level because preparation and implementation of a landscaping and forest management plan would provide effective visual screening of the golf course.

IMPACT 3.7-3 (Alt. 2)	Potential for Increases in Light or Glare. *Under Alternative 2, permanent lighting would be added to the unpaved parking area adjacent to the clubhouse. However, the existing parking area and clubhouse are currently sources of light and glare, and this increase in lighting is expected to be minimal. In addition, Alternative 2 would not include construction during nighttime hours; therefore, no lighting would be used during construction. This impact would be* ***less than significant****.*

Construction would not take place at night and would not require construction site lighting. Consequently, there would be no significant light or glare effects during project construction.

Under Alternative 2, additional lightning would be installed at the newly paved parking area adjacent to the golf course entrance. The golf course parking area lighting is currently used to light the parking areas for clubhouse events that may occur in the evening and end by 10 p.m. Lighting is not used to light the golf course, which is closed at dusk. Lighting use would continue to be for the purpose of lighting the parking area for specific events, ending at 10 p.m.

According to the TRPA Design Review Guidelines lighting standards, lighting shall be directed downward, and lighting fixtures shall not exceed 10–12 feet in height (TRPA 1989a:30-5 and 30-6). All new lighting would comply with TRPA's Design Review Guidelines. In addition, the restroom facilities would be constructed of nonreflective materials and would not include any exterior lighting. Because the new lighting would be near the existing parking area and clubhouse, which are existing sources of light and glare, and because the proposed lighting would be minimal and would be consistent with TRPA's lighting design guidelines, Alternative 2 would not create substantial light and glare effects in the long term. Therefore, this impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.7-1 (Alt. 3) **Potential for Short-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *Construction activities and staging areas within the study area would be visible from U.S. 50, the existing golf course, and trails within Washoe Meadows SP. Construction activities may also be partially visible from the adjacent neighborhoods, and construction vehicles and equipment would travel on U.S. 50, which is designated as a scenic highway. Because construction-related scenic effects would be temporary and limited to the visibility of typical construction vehicles and ground-level activities, this impact would be* ***less than significant****.*

Implementation of Alternative 3 would include construction activities associated with removing golf course holes adjacent to the river and bridges. A reduced play golf course, such as an executive or 9-hole regulation course, would be constructed on the east side of the river and would be designed to minimize the golf footprint within the SEZ. All bridges would be removed from the Upper Truckee River, and four bridges would be removed from Angora Creek and restoration activities would occur along the Upper Truckee River and floodplain. Alternative 3 would not include construction associated with paving the grassy area at the golf course entrance or relocating golf course holes to the west side of the river. Construction would take place between May 1 and October 15 (possibly November 1 if weather allows and an extension is granted) of each year for a 3- to 4-year period. During these construction windows, heavy equipment and associated vehicles, construction workers, staging areas, and construction activities would be visible or partially visible from U.S. 50, across U.S. 50, the existing golf course, and adjacent neighborhoods.

In addition, large construction vehicles and equipment would use U.S. 50 as a travel route to and from the study area, which could degrade views along the highway. Although construction of this alternative would cause some changes in views for travelers on U.S. 50 and from the surrounding area, these changes would be temporary and minor.

Views of construction would not be visible from neighborhoods west and south of Washoe Meadows SP under this alternative, and views of construction from trails within Washoe Meadows SP would be limited. However, some construction vehicles would be visible accessing the area from Chilcothe Street**.** Views from adjacent neighbors south of the golf course would be affected by construction-related activities. All viewer groups would be affected by this change in visual quality, although the effect would vary in degree depending on the viewer location and sensitivity. Although construction of Alternative 3 would cause some changes in views, these changes would be temporary and minor and would be less than under Alternative 2. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.7-2 (Alt. 3) **Potential for Long-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *There could be some long-term changes in views of the golf course and parking area from U.S. 50 and neighborhoods surrounding the golf course. However, these long-term changes in views would be minor and are not considered adverse. In addition, there would be no changes in views for nearby residents south and west of Washoe Meadows SP. Because there would be no substantial changes to the long-term views, this impact would be* ***less than significant****.*

Under Alternative 3, several golf course holes adjacent to the river would be removed, and the area previously occupied by golf course would be restored. However, under Alternative 3, no golf course holes would be relocated to the west side of the river within Washoe Meadows SP, no trees within Washoe Meadows SP would be removed for the relocated golf course, and the grassy area at the golf course entrance would not be paved. Therefore, this alternative would primarily result in minor long-term changes in views to the eastern portion of the study area.

Eastern Area – Lake Valley SRA

Under Alternative 3, there could be long-term changes in views of the golf course from U.S. 50. Several golf course holes currently located along the river would be removed, and the area adjacent to the river would be restored. All the bridges across the river and Angora Creek would also be removed. Brief views of this area from U.S. 50 would change from golf course greens to native landscape. These changes in views would be minimal, primarily in the northern portion of the golf course, and are not considered adverse (because the outcome would be a restored natural landscape). In addition, views of these changes would be limited because of intervening vegetation, topography, and structures (i.e., the clubhouse).

The grassy area at the golf course entrance would not be paved under this alternative, and there would be no changes to the clubhouse, driving range, or maintenance buildings, which are prominent features visible from U.S. 50. Within the eastern portion of the study area, the primary changes in visual character would be from golf course greens adjacent to the river to native landscapes and from removal of the existing golf course bridges, similar to Alternative 2. This change in views is not considered adverse and would primarily be visible to golfers from within the existing golf course; however, there may also be distant views from adjacent neighborhoods surrounding the golf course. Changes in views of the eastern portion of the study area would not substantially degrade views from any scenic vistas or any sensitive viewpoints (i.e., surrounding neighborhoods).

Because there would be no substantial changes to the long-term views from U.S. 50 or the eastern portion of the study area, this impact would be less than significant.

Western Area – Washoe SP

Under Alternative 3, no golf course holes would be relocated to the west side of the river, and as a result, there would be no changes to the visual character of Washoe Meadows SP. The substantial tree removal that would occur under Alternative 2 for the relocated golf course would not occur under Alternative 3.

Residences in the North Upper Truckee neighborhood to the south and west would not experience a change in long-term views under Alternative 3. However, existing views of the golf course adjacent to the river from trails within Washoe Meadows SP would change slightly. These views would change from golf course greens to native landscape. This change in views is not considered adverse.

Because implementing Alternative 3 would result in only minor changes in long-term views in the study area and those changes are not considered adverse, this impact would be less than significant.

No mitigation is required.

IMPACT 3.7-3 (Alt. 3) **Potential for Increases in Light or Glare.** *Alternative 3 would not include construction during nighttime hours; therefore, no lighting would be used during construction. In addition, no new long-term sources of light or glare are proposed under Alternative 3.* ***No impact*** *would occur.*

Alternative 3 would have no effect on light and glare. No new facilities with lighting are proposed. Because Alternative 3 does not propose a restroom, a lighted parking area, or facilities within Washoe Meadows SP, there would be no increases in glare associated with Alternative 3. Furthermore, no lighting would be necessary for construction purposes because construction would not take place at night. Therefore, this alternative would not introduce any new sources of short-term or long-term light or glare. No impact would occur.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.7-1 (Alt. 4) **Potential for Short-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *Construction activities and staging areas within the study area may be visible from U.S. 50, the existing golf course, trails within Washoe Meadows SP, and neighborhoods adjacent to the golf course over a period of approximately 2–3 years. Furthermore, construction vehicles and equipment would travel on U.S. 50, which is designated as a scenic highway. However, construction activities would be temporary and minor. This impact would be* ***less than significant****.*

This impact would be similar to Impact 3.7-1 (Alt. 2) because there would be construction activities associated with river stabilization and paving of the unpaved parking area, and construction vehicles would travel on U.S. 50. Staging areas would be visible from U.S. 50 and across U.S. 50 during construction, and additional staging areas for construction would be visible from the eastern and western portions of the study area. However, this alternative would require less construction than Alternative 2 because no golf course holes would be relocated to the west side of the river and the construction window would be approximately 1 year shorter than under Alternative 2. The short-term changes in views would be temporary and minor, and construction activities would be intermittent and would occur only during the designated work periods. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.7-2 (Alt. 4) **Potential for Long-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *Alternative 4 would include stabilization of the river and paving of the unpaved parking area at the golf course entrance, which would be visible following construction. However, these long-term changes in views would be minor and are not considered adverse. In addition, nearby residents south and west of Washoe Meadows SP would not experience changes in long-term views. Because there would be no substantial changes to the long-term views from U.S. 50 or the surrounding area, this impact would be* ***less than significant.***

This impact would be similar to Impact 3.7-2 (Alt. 3) because the only long-term change in views would be from U.S. 50 and within the eastern portion of the study area. Under Alternative 4, long-term changes in views would involve paving of the unpaved parking area north of the golf course entrance, construction of a restroom facility, and stabilization of the river. The segment of river flowing through the golf course would be stabilized; however, this would not be visible from U.S. 50 because of intervening topography, distance, and structures. In addition, there would be no changes to the clubhouse or maintenance facilities under this alternative. As described under Alternative 3, paving of the unpaved parking area would result in changes only to ground-level views and would not be intrusive.

Long-term changes in views within the eastern portion of the study area associated with stabilization of the river involve both rock armor and biotechnical streambank protection. Alternative 4 would involve placement of additional rock material along the banks compared to Alternative 2 and existing conditions, the use of biotechnical materials would allow for materials on banks to blend into the surroundings. The golf course greens would continue to be located adjacent to the riverbanks. The restroom facility would be visible from the eastern portion of the study area; however, this facility would be small, designed with natural colors to blend in with the surrounding landscape, and blocked from view with strategically placed vegetative cover.

In addition, there would be no change in long-term views of the western portion of the study area. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.7-3 (Alt. 4)	Potential for Increases in Light or Glare. *Under Alternative 4, permanent lighting would be added to the parking area adjacent to the clubhouse. However, the existing parking area and clubhouse are currently sources of light and glare, and this increase in lighting is expected to be minimal. In addition, Alternative 4 would not include construction during nighttime hours; therefore, no lighting would be used during construction. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-3 (Alt. 2) because this alternative would not introduce any new sources of short-term light or glare but would introduce new lighting to the newly paved parking area adjacent to the golf course entrance. This lighting would comply with TRPA's Design Review Guidelines for lighting. In addition, the restroom facility proposed near holes 5 and 6 would be constructed of nonreflective materials and would not increase glare in the study area. No exterior lighting is proposed for the restroom facility. Therefore, this impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.7-1 (Alt. 5)	Potential for Short-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B. *Construction activities and staging areas within the study area may be visible from U.S. 50, trails within Washoe Meadows SP, and adjacent neighborhoods. Construction vehicles and equipment would also travel on U.S. 50, which is designated as a scenic highway. Because construction-related effects would be minor and temporary, this impact would be* ***less than significant****.*

Alternative 5 would include construction activities associated with decommissioning the 18-hole golf course and restoring the river in a manner similar to that proposed for Alternatives 2 and 3. Under Alternative 5, the existing golf course would be restored to native landscape. If economically feasible, a temporary nine-hole golf course may remain in place while State Parks evaluates alternative uses of this meadow area; therefore, a phased construction approach may occur. Construction activities under Alternative 5 would be similar to those under Alternatives 2 and 3 on the eastern side and, compared to Alternative 4, would be more visible from U.S. 50, adjacent neighborhoods and trails within Washoe Meadows SP because construction activities would occur throughout the golf course. Two staging areas would also be visible from U.S. 50 during construction, and additional staging areas would be visible from the eastern and western portions of the study area. In addition, large construction vehicles and equipment would use U.S. 50 as a travel route to and from the study area, which could degrade views along the highway. Views of construction would not be visible to neighborhoods west and south of Washoe Meadows SP, as under Alternative 2. However, some trucks would access the study area using Chilicothe Street. There would be views of construction from trails within Washoe Meadows SP. No construction activities would be associated with the clubhouse, parking area, or maintenance buildings under this alternative.

Although construction of this alternative could cause some changes in short-term views for travelers on U.S. 50 and the surrounding area, these changes would be temporary and minor. Thus, construction activities associated with Alternative 5 would not substantially degrade views from U.S. 50 or the surrounding area. This impact would be less than significant.

No mitigation is required.

IMPACT 3.7-2 (Alt. 5) **Potential for Long-Term Degradation of the Existing Visual Character, Existing Visual Quality, or Scenic Quality of Roadway Travel Unit 36B.** *Alternative 5 would include decommissioning of the existing golf course, restoration of the river, and removal of golf course bridges that would be visible following construction. These long-term changes in views would be visible from U.S. 50 and the adjacent neighborhoods. Although long-term changes in views would change, these changes are not considered adverse. Therefore, this impact would be* ***less than significant****.*

Under Alternative 5, no golf course holes would be relocated to the west side of the river within Washoe Meadows SP, no trees within Washoe Meadows SP would be removed for the relocated golf course, and the grassy area north of the golf course entrance would not be paved. Therefore, this alternative would primarily result in long-term changes in views to the eastern portion of the study area.

Eastern Area – Lake Valley SRA

Under Alternative 5, there would be long-term changes in views of the golf course from U.S. 50. The 18-hole regulation golf course would be decommissioned, and the river would be restored in a manner similar to that proposed for Alternatives 2 and 3. The area occupied by the existing golf course would be restored to native landscape, and all of the existing bridges across the Upper Truckee River, Angora Creek, and the unnamed creek would be removed. Although there would be substantial changes in views associated with the golf course compared with views under other alternatives, a change in existing views to views of natural landscape is not considered adverse. In addition, the unpaved parking area north of the golf course entrance would not be paved under this alternative, and there would be no changes to the clubhouse, existing parking area, or maintenance buildings, which are prominent features visible from U.S. 50. Long-term changes in views from U.S. 50 are not considered adverse.

In addition, views of the golf course from adjacent residences and from trails within Washoe Meadows SP would change from golf course tees, fairways, bunkers, greens, and cart paths to views of restored meadow and riparian habitat. These modifications would result in substantial change in views; however, increasing the natural landscape would be consistent with the surrounding landscape and these changes are not considered adverse and would be less than significant.

Western Area – Washoe Meadows SP

No golf course holes would be relocated to the west side of the river as part of Alternative 5, and as a result, there would be no changes to the visual character of Washoe Meadows SP from surrounding areas or within Washoe Meadows SP. The only tree removal that would occur under Alternative 5 would be associated with ongoing forest management within Washoe Meadows SP and minor tree removal to access construction areas adjacent to the river. The substantial tree removal that would occur under Alternative 2 for the relocated golf course would not occur under Alternative 5.

Residences in the North Upper Truckee neighborhood to the south and west would not experience a change in views under Alternative 5. However, existing views of the golf course from trails within Washoe Meadows SP would change. These views would change from golf course tees, fairways, bunkers, greens, and cart paths to natural meadow and riparian habitats, consistent with the natural landscape of Washoe Meadows SP and the surrounding area. Although implementing Alternative 5 would result in changes to views in the study area, these changes would be consistent with the surrounding landscape and are not considered adverse. This impact would be less than significant.

No mitigation is required.

IMPACT 3.7-3 (Alt. 5)	**Potential for Increases in Light or Glare.** *Alternative 5 would not include construction during nighttime hours; therefore, no lighting would be used during construction. In addition, no new long-term sources of light or glare are proposed under Alternative 5.* ***No impact*** *would occur.*

This impact is similar to Impact 3.7-3 (Alt. 3) because this alternative would not introduce any new sources of short-term or long-term light or glare. Alternative 5 would not include facilities within Washoe Meadows SP; therefore, there would be no increases in glare associated with new facilities. No impact would occur.

No mitigation is required.

3.8 RECREATION

This chapter summarizes the regulatory and planning processes for recreation in the Tahoe Basin, describes existing recreation uses and facilities in the project vicinity, and presents an analysis of potential impacts of the proposed alternatives. It addresses impacts on recreation uses and facilities located in the study area and surrounding area of South Lake Tahoe. Consistency with TRPA goals and policies is presented in Section 3.2, Land Use," Table 3.2-1. Cumulative recreation impacts are discussed in Section 3.16, "Cumulative Impacts." The project effects on thresholds are described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

3.8.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

No Federal plans, policies, ordinances, laws, regulations, or executive orders related to recreation are applicable to the project.

State

Lake Valley State Recreation Area General Plan

State Parks manages more than 270 park units, which contain the "finest and most diverse collection of natural, cultural, and recreational resources to be found within California" (State Parks 2008). The mission of California State Parks is "…to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation" (State Parks 2001:11).

The study area includes Lake Valley SRA and a portion of Washoe Meadows SP; the area was divided into two units to allow for different management goals, including recreation. The Lake Valley SRA General Plan (General Plan) was prepared by State Parks to satisfy requirements of Public Resources Code Section 5002.2 and provide guidelines for long-term management and development of Lake Valley SRA (State Parks 1988). The plan summarizes all available information about the SRA, documents the planning process and relevant data applied in making land use decisions, and describes specific management and development proposals. At the time the plan was prepared in1988, the declaration of purpose for the unit states that designation of Lake Valley SRA "recognizes the significance of the unit in perpetuating an existing quality public golfing opportunity in the increasingly popular Tahoe Basin, where golfing demand far exceeds the opportunities" (State Parks 2008:34). The "Resource Policy Formulation" section of the plan outlines the declaration of purpose for Lake Valley SRA, focusing on two major considerations:

- The purpose of Lake Valley SRA is to make available to the people for their enjoyment and inspiration the 18-hole golf course and the scenic Upper Truckee River and its environs.

- State Parks shall balance the objectives of providing optimum recreational opportunities with maintaining the highest standards of environmental protection. In so doing State Parks shall define and execute a program of management within the unit that perpetuates the unit's declared values, providing for golfing along with other compatible summer and winter recreation opportunities while restoring the natural character and ecological values of the Upper Truckee River, protecting its water quality, and protecting and interpreting significant natural, cultural, and scientific values.

Specific policy direction states that recreation allowed at Lake Valley SRA should take into account and conform to natural and cultural resource values, and the effect such recreation would have on public use and resources of the contiguous Washoe Meadows SP should be considered (State Parks 1988:4).

Lake Tahoe Golf Course is an 18-hole, regulation-length course operated by American Golf under a 20-year concession agreement with State Parks. The agreement expired on March 31, 2009; however, American Golf continues to manage the golf course under the terms of the now expired agreement. The agreement will not be renewed until after a preferred alternative has been selected. Although the concession agreement is contractual rather than regulatory and has not yet been renewed, it is relevant because it contains operational requirements for the golf course, which American Golf is currently following.

In keeping with the General Plan, the concessionaire contract (State Parks 1995) explicitly states: “Of prime importance under this contract is the requirement to balance the dual objectives of providing a quality golfing experience and protecting the ecologically sensitive Upper Truckee River and the natural environment of Lake Valley State Recreation Area.”

A key consideration of State Parks with regard to the operation of the golf course is affordability. Section 7 of the concessionaire contract states, “It is the intent of the State under this contract to provide the general public with the opportunity to enjoy quality golfing and winter recreational opportunities at reasonable and affordable prices. Service to the public, with goods, merchandise, and services of the best quality and at reasonable charges, is of prime concern to the State…” Under terms of the concession contract, amended in 1995, a maximum green fee of $40.00 was considered by the State to be fair and reasonable at that time. Increases to this green fee benchmark are made based on changes in the California Consumer Price Index, or other extraordinary circumstances justified by the concessionaire and approved by the State. As of January 2010 the maximum rate of a green fee is $59.00.

In addition, per the terms of the agreement, American Golf must allocate 5 percent of gross annual receipts to a Capital Improvements Program (CIP) fund, which is interest-bearing and administered by the concessionaire for capital improvements or resource management projects with direction by and approval of the State. The State may elect to receive all or part of the CIP funds, including accrued interest, as additional rent (HEC 2008 [Appendix E]).

Revenues generated by Lake Tahoe Golf Course are important to State Parks. The revenue of Lake Tahoe Golf Course operations is the fifth largest source of concession revenue in the State Parks system (California State Parks, Fiscal Year 2006/07).

Washoe Meadows State Park

No general plan has been prepared for Washoe Meadows SP because it is an undeveloped unit. The purpose of Washoe Meadows SP is to preserve and protect a wet meadow area associated with Angora Creek and the Upper Truckee River at the southwestern side of the Tahoe Basin. The statement of purpose indicates that State Parks will preserve, protect, restore, interpret and manage the unit’s natural, cultural, and aesthetic resources, features and values of Washoe Meadows SP, making them available to the public for their educational, inspirational and recreational benefits.

Tahoe Regional Planning Agency

Recreation planning, policy, and use in the Tahoe Basin are governed primarily by TRPA. TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (Regional Plan). The Regional Plan, adopted in 1987 and currently being updated, consists of several documents: Goals and Policies, Code of Ordinances, Plan Area Statements, Water Quality Management Plan, Regional Transportation Plan—Air Quality Plan, and Scenic Quality Improvement Plan. Chapter 5, “Compliance with Applicable Federal Laws and Executive Orders and State Laws and Regulations,” of this draft EIR/EIS/EIS provides additional information on TRPA and other agency regulatory and planning processes for the Tahoe Basin.

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

TRPA is reevaluating nine environmental threshold carrying capacities (thresholds) it established previously to define the levels of environmental quality desired for the region. This includes recreation thresholds, addressed under “TRPA Environmental Threshold Carrying Capacities” below. New research, science, and collaboration at the community level will contribute to development of the updated report.

Regional Plan Goals and Policies

The Goals and Policies portion of the Regional Plan establishes an overall framework for development and environmental conservation in the Tahoe Basin. Chapter V (Recreation Element) of TRPA’s Goals and Policies (TRPA 2004) covers dispersed recreational activities, urban recreation facilities, and developed recreation facilities. Chapter V established goals and policies of three subelements, including dispersed, developed, and urban recreation. Dispersed recreational activities include hiking, riding, cross-country skiing, and back country camping. Developed recreational facilities include day use areas, recreation centers, golf courses, participant sports facilities, and sport assembly. Urban recreation is normally provided in urban areas and is primarily intended to serve local needs. Dispersed recreation use normally takes place in the rural portions of the Basin while developed recreation is provided in both rural and urban settings (TRPA 2004).

The goals and policies are intended to ensure that recreational opportunities keep pace with public demand, recreation facilities remain high on the development priority list, and the quality of the outdoor recreational experience is maintained. This is summarized in the general policy statement:

> It shall be the policy of the TRPA Governing Body in development of the Regional Plan to preserve and enhance the high quality recreational experience including preservation of high-quality undeveloped shorezone and other natural areas. In developing the Regional Plan, the staff and Governing Body shall consider provisions for additional access, where lawful and feasible, to the shorezone and high quality undeveloped areas for low density recreational uses.
>
> It shall be the policy of the TRPA Governing Body in development of the Regional Plan to establish and ensure a fair share of the total Basin capacity for outdoor recreation is available to the general public.

For this analysis, the Recreation Element’s Dispersed Recreation subelement relates to recreation within Washoe Meadows SP, and the Developed Recreation subelement relates to the Lake Tahoe Golf Course.

Dispersed Recreation Goals

The following specific goals and policies for Dispersed Recreation are applicable to the project.

GOAL 1: Encourage opportunities for dispersed recreation when consistent with environmental values and protection of the natural resources.

- **Policy1:** Low density recreational experiences shall be provided along undeveloped shorelines and other natural areas, consistent with the tolerance capabilities and character of such areas.
- **Policy 2:** Areas selected for nature study and wildlife observation shall be appropriately regulated to prevent unacceptable disturbance of the habitat and wildlife.

- **Policy 3:** Trail systems for hiking and horseback riding shall be expanded to accommodate projected demands and provide a link with major regional or interstate trails.

- **Policy 4:** Existing trails that are either underutilized or located in environmentally sensitive areas shall be relocated to enhance their use and to protect natural resources.

GOAL 2: Provide high-quality recreational opportunities.

- **Policy 1:** Wilderness and other undeveloped and unroaded areas shall be managed for low-density use.

- **Policy 2:** Separate use areas shall be established for the dispersed winter activities of snowmobiling, cross-country skiing and snowshoeing when conflicts of use exist.

Developed Recreation Goals

The following specific goals for Developed Recreation are applicable:

GOAL 1: Provide a fair share of the total basin capacity for outdoor recreation.

GOAL 2: Provide for the appropriate type, location, and rate of development of outdoor recreational uses.

- **Policy 2:** Bicycle trails shall be expanded to provide alternatives for travel in conjunction with transportation systems.

GOAL 3: Protect natural resources from overuse and rectify incompatibility between uses.

- **Policy 1:** Recreation development in the Tahoe basin shall be consistent with the special resources of the area.

- **Policy 2:** Regulate intensity, timing, type, and location of use to protect resources and separate incompatible uses.

For a full evaluation of the consistency of the alternatives with these policies see Section 3.2, "Land Use."

Code of Ordinances

As described in Chapter 33 of the TRPA Code of Ordinances, TRPA regulates additional recreation use in the Lake Tahoe basin and has adopted the following required findings for approval:

1. There is a need for the project;

2. The project complies with the Goals and Policies, the applicable plan area statements, and Code;

3. The project is consistent with TRPA's targets for outdoor recreation, which are 6,114 PAOT in overnight facilities, 6,761 PAOT in summer day-use facilities, and 12,400 PAOT in winter day-use facilities, as well as the allocations set forth in the plan area statements, or the pools of reserved PAOT capacity;

4. The project meets the findings adopted pursuant to Article V(g) of the Compact as set forth in Chapter 6 as they are applicable to the project's recreational service capacity; and

5. If the project requires PAOT allocations, it is consistent with the TRPA Environmental Improvement Program (EIP).

TRPA has established targets for each of the threshold areas. For the recreation threshold, targets have been identified for outdoor recreation to evaluate threshold attainment. One of the indicators used to measure attainment are PAOT for overnight facilities, summer day-use facilities, and winter day-use facilities. TRPA regulates the rate and distribution of expanding recreational uses in the Lake Tahoe region by allocating PAOTs.

Golf courses are considered a summer day-use facility for purposes of PAOT allocation. The following types of summer day-use facilities require PAOTs:

1. Uses subject to summer day-use PAOT allocation include marinas, boat launching facilities, rural sports, golf courses, visitor information centers, and off-road vehicle courses.

2. Recreation centers, participant sport facilities, sport assembly, beach recreation, and day use areas, operated by the states' Departments of Parks and Recreation or their permittees, or by federal agencies or their permittees shall be subject to summer day use PAOT allocation.

3. Shorezone uses requiring summer day use PAOT allocations include tour boat operation and those portions of beach recreation, commercial boating, or water-oriented outdoor recreation concessions, which provide additional outdoor recreation capacity (TRPA 1991:33-27).

Plan Area Statements

TRPA allocates PAOTs to plan area statements (PAS), community plans, and a reserve pool where PAOTs are held in reserve for overnight and summer day-use facilities. If a proposed expansion of recreation facilities meets TRPA's criteria, the project will be approved. The number of PAOTs necessary to accommodate the increased level of activity associated with a project, if any, will be assigned from the PAOTs allocated to the relevant PAS, community plan, or reserve pool. Through this process, TRPA essentially will grant permission for the project to increase use of a recreation facility by a particular number of people. PAOT disposition allows agencies to quantitatively measure development of recreation facilities and assess how well the development of recreation facilities is keeping pace with other urban development pressures, such as residential and commercial development.

The study area for this project is located in PAS 119, Country Club Meadow. Targets and limits for additional developed outdoor recreation facilities to be located within this plan area have been identified, as specified in Chapter 13 of TRPA's Code of Ordinances, "Plan Area Statements and Plan Area Maps," Country Club Meadow #119. No additional PAOT capacity for summer-day, winter-day, or overnight uses is allocated to PAS 119; however, 6,215 summer-day use PAOTs are available in the reserve pool described in the Code of Ordinances, and discussed in that section above. The Upper Truckee River Restoration and Golf Course Reconfiguration Project is an EIP project, therefore, PAOTs could be allocated from the pool (TRPA 2007:10-9).

The land use classification for PAS 119 is Recreation, and the PAS establishes a list of permissible uses that may occur within this classification. Permissible uses either are classified as allowed (A) or must be considered under the provisions for a special use (S). Existing uses not listed are considered nonconforming uses within this plan area, and the establishment of new uses not listed is prohibited (TRPA Code of Ordinances, Chapter 13). Permissible uses for this PAS include cross-country skiing courses (S), day-use areas (A), riding and hiking trails (A), participant sports (S), developed campgrounds (A), outdoor recreation concessions (A), rural sports (S), group facilities (S), golf courses (A), snowmobile courses (S), and a visitor information center (A).

The PAS also identifies planning considerations and special policies that must be considered (TRPA Code of Ordinances, Chapter 13). The following planning consideration related to recreation is applicable:

#7 The Upper Truckee River, which flows through this area, provides excellent fish spawning and feeding habitats and perhaps offers the best quality stream fishing in the entire Basin. (Note: This statement is based on the entire Upper Truckee River, while existing data on the study area shows that habitat is degraded. See Section 3.5, “Biological Resources” for additional information on habitat.

Special policies that apply to the project relative to recreation are:

#2 Whenever possible, opportunities for restoration of disturbed stream environment zones and land coverage removal should be encouraged, including strategies to mitigate the impacts of the golf course.

#6 Improved river access for fishing should be provided.

Lake Tahoe Regional Bicycle and Pedestrian Master Plan

The *Lake Tahoe Regional Bicycle and Pedestrian Master Plan* was prepared by TRPA and the Tahoe Metropolitan Planning Organization. The plan provides a blueprint for developing a regional bicycle and pedestrian system that includes both on-street and off-street facilities as well as support facilities and programs throughout the Lake Tahoe region. It contains conceptual trail alignments for various areas throughout the Tahoe Basin. The plan identifies proposed bike routes for neighborhoods east, west, and north of Washoe Meadows SP and Lake Valley SRA (TRPA 2006: Figure 8, Appendix A).

Environmental Threshold Carrying Capacities

TRPA analyzes its thresholds every 5 years to evaluate the progress made toward attainment, or to achieving the levels of environmental quality defined in the thresholds. The most recent evaluation was completed in 2006. The two indicators for recreation are written as policy statements and include:

- **Recreation Threshold Indicator 1 (R1)—Quality Experience and Additional Access.**
  It shall be the policy of the TRPA Governing Body in development of the Regional Plan to preserve and enhance the high-quality recreational experience including preservation of high-quality undeveloped shorezone and other natural areas. In developing the Regional Plan, the staff and Governing Body shall consider provisions for additional access, where lawful and feasible, to the shorezone and high-quality undeveloped areas for low-density recreational uses.

- **Recreation Threshold Indicator 2 (R2)—Fair Share of Resource Capacity.**
  It shall be the policy of the TRPA Governing Body in development of the Regional Plan to establish and ensure a fair share of the total Basin capacity for outdoor recreation is available to the general public.

R1 consists of two parts, (1) preservation and enhancement of a high-quality recreation experience and (2) the provision of additional high-quality, undeveloped lands for recreation, including lake access. R1 is a policy standard, and no numerical standards have been established to determine attainment status of the threshold. However, various numerical indicators, such as linear feet of shoreline or miles of bike trail, are used to gain insight into whether or not the desired standard is being met. In and of themselves, these quantifiable aspects do not express the quality of the recreation experience, nor are they a true expression of access to undeveloped lands, but collectively they provide insight on threshold status (TRPA 2007:10-3). The measures used to assess R1 threshold attainment are described below.

The quality of recreation experience is measured in surveys conducted by TRPA and other recreation providers. Such surveys compare the importance of an identified recreation attribute, such as recreation facilities and conditions, with the experience that the recreationists perceive.

A second part of the threshold indicator is the provision of additional access to the lake and other natural features by the general public. This indicator is supported by public land acquisition programs as well as the provision of additional trails and trailheads, including bicycle trail segments and their supporting amenities.

Overall, the R1 threshold is considered to be in attainment with respect to Quality Experience and Additional Access (TRPA 2007). Because of the threshold's subjective nature, it is difficult to evaluate the attainment status of R1. However, based on recreation user perception surveys (State Parks 2006a) completed since the 2001 threshold evaluation, expectations of visitors and residents related to recreation are being met; therefore, the recreation experience component of the threshold indicator is considered to be in attainment in the *2006 Threshold Evaluation Report* (TRPA 2007:10-3).

R2 is intended to ensure that a fair share of the region's outdoor recreation capacity is available to the general public. The threshold indicators for R2 are more quantifiable than those for R1. Three indicators provide a mechanism for evaluation: cumulative accounts of PAOT allocations, when applicable; facilities development for recreation projects that do not require PAOT allocations; and land acquisition of new public lands that support recreation purposes. Overall, TRPA's 2001 and 2006 threshold evaluation reports concluded that an appropriate level of outdoor recreation facility development, has been planned (TRPA 2002:10-22; TRPA 2007:10-8). Therefore, this recreation capacity indicator is considered to be in attainment.

El Dorado County

Chapter 9, Parks and Recreation Element, of the *El Dorado County General Plan* establishes goals, objectives, and policies that address the long-range provision and maintenance of parks and recreation facilities necessary to improve the quality of life of existing and future El Dorado County residents (El Dorado County 2004). While El Dorado County does not have oversight over State property the following goals, objectives, and policies related to recreation are listed below for reference:

GOAL 9.1: Parks and Recreation Facilities. Provide adequate recreation opportunities and facilities including developed regional and community parks, trails, and resource-based recreation areas for the health and welfare of all residents and visitors of El Dorado County.

Objective 9.1.2: County Trails. Provide for a County-wide, non-motorized, multi-purpose trail system and trail linkages to existing and proposed local, State, and Federal trail systems. The County will actively seek to establish trail linkages between schools, parks, residential, commercial, and industrial uses and to coordinate this non-motorized system with the vehicular circulation system.

- **Policy 9.1.2.8:** Integrate and link, where possible, existing and proposed National, State, regional, County, city and local hiking, bicycle, and equestrian trails for public use.

Objective 9.1.3: Incorporation of Parks and Trails. Incorporate parks and non-motorized trails into urban and rural areas to promote the scenic, economic, and social importance of recreation and open space areas.

- **Policy 9.1.3.3:** Coordinate with Federal, State, other agencies, and private landholders to provide public access to recreational resources, including rivers, lakes, and public lands.

Objective 9.3.1: Recreational and Tourist Uses. Protect and maintain existing recreational and tourist based assets such as Apple Hill, State historic parks, the Lake Tahoe Basin, wineries, South Fork of the American River, and other water sport areas and resorts and encourage the development of additional recreation/tourism businesses and industries.

Objective 9.3.2: Natural Resources. Protect and preserve those resources that attract tourism.

ENVIRONMENTAL SETTING

Recreational opportunities in the Tahoe Basin are abundant, diverse, and generally associated with Lake Tahoe's open water (e.g., swimming, boating, personal watercraft use, fishing), shoreline (e.g., sunbathing, camping, bicycling, sightseeing), river recreation (e.g., fishing, canoeing, swimming), and the terrain surrounding the lake (e.g., hiking, mountain biking, skiing, snowboarding). Furthermore, several high-quality golf courses are located in the Tahoe Basin; among them is the Lake Tahoe Golf Course. Because Lake Valley SRA and Washoe Meadows SP are not associated with lake- and shoreline-oriented recreation, facilities in the study area primarily provide opportunities for land-based recreation, such as golfing, hiking, biking, and cross-country skiing. However, ample recreation opportunities are associated with the Upper Truckee River, including fishing, swimming, and canoeing. For this analysis, the affected environment is generally confined to the South Lake Tahoe area—specifically, the communities of South Lake Tahoe and Meyers, California.

The study area is located within Lake Valley SRA and Washoe Meadows SP (see Exhibits 2-1and 2-3, in Chapter 2, “Project Alternatives”). The area includes the reach of the Upper Truckee River that extends from an entry point at the southern boundary of Washoe Meadows SP, near Chilicothe Street, to a point just west of U.S. 50 where the river exits Lake Valley SRA. The study area is generally bounded by U.S. 50 to the east, Sawmill Road to the north, the North Upper Truckee residential area to the west, and Bakersfield Street and Country Club Drive to the south and southeast.

Washoe Meadows State Park

Washoe Meadows SP consists of meadows and forest in a valley and hillslopes at the base of an escarpment that leads to Echo Summit, and includes a reach of the Upper Truckee River. The park was named for the Native Americans who inhabited the area for thousands of years (State Parks 2006b). Washoe Meadows SP is an undeveloped park; it has no formal entrance or visitor center, access points, parking, or developed infrastructure. Informal parking occurs largely along neighborhood streets. No signage directs visitors to the park.

Washoe Meadows SP does not have an official trail system in place; trails are either user-created, “volunteer” trails (i.e., voluntarily established by trail users, also known as “casual” trails), or user-adopted preexisting trails or unpaved roads that were constructed for logging, quarry pit, or sewer line access prior to purchase of the property by State Parks. Of these, a few have been used as park service roads that now act as major routes for the public to easily access dispersed areas within the park. Although the park unit has not been developed, Washoe Meadows SP is used for informal, dispersed recreation activities, primarily on a network of casual trails near and along the Upper Truckee River and connecting to residential neighborhoods. The trails are not officially established or designated by State Parks or in the *Lake Tahoe Regional Bicycle and Pedestrian Master Plan* (TRPA 2006: Appendix A, Figure 9).

State Parks mapped and conducted an assessment of the roads and trails in Washoe Meadows SP to characterize existing layout, use, and conditions to assist with interim management planning. Use categories include areas open to State Park and public utility service and maintenance vehicles, nonmotorized recreation, hiking-only trails, and temporary or restored trails that do not support substantial recreation activity. The roads and trails in Washoe Meadows SP are open to nonmotorized recreation on an informal basis, and drivable roads are open to state and public service patrol and maintenance vehicles. No other vehicle access is allowed in Washoe Meadows SP.

The Upper Truckee River is used seasonally, primarily during the spring runoff period, for nonmotorized watercraft activities including kayaking and canoeing. The river is also used for limited fishing activity along the reach of the Upper Truckee River that extends through Lake Valley SRA and Washoe Meadows SP, with the trout fishing season typically extending from July 1 through October 1. Other river uses in the warmer months include swimming and lounging along the river banks.

Winter recreation activities within Washoe Meadows SP include informal cross-country skiing and snowshoeing. Although snowmobiling is not allowed within Washoe Meadows SP, there is a high level of illegal snowmobile activity from surrounding areas. Entry and exist points have been documented by visual tracks along the park boundaries.

Washoe Meadows SP Recreation Use and Access Survey

State Parks personnel conducted a detailed user survey for Washoe Meadows SP for June–September 2006 and 2007 (State Parks 2009). The purpose of this survey was to assist State Parks in its ongoing planning and management efforts in the area and to establish baseline levels of recreation use and access for environmental review purposes and park management objectives. The protocol was designed to answer these primary questions:

- What type and frequency of recreational uses are occurring in the park units?
- Where, within the park units, is recreational use occurring?

Multiple techniques were used to capture the diverse set of visitors over a large area. The methods employed were:

- Observational forms (Washoe Meadows SP)
- Personal interviews with comments and map (Washoe Meadows SP)
- Mail-in interview forms with comments and map
- Public recreation planning workshops

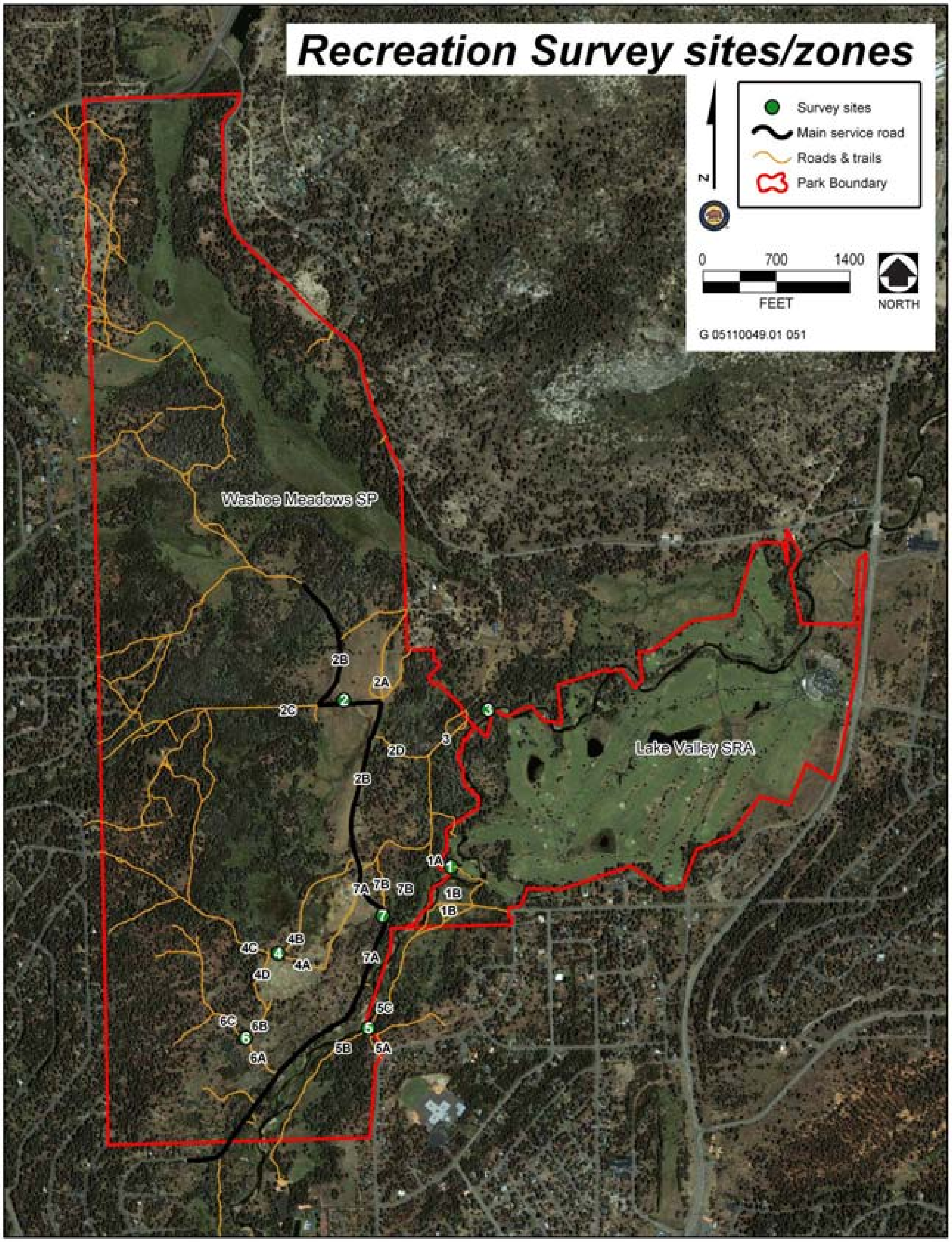
Both interactive survey methods (personal interviews) and observation-based survey methods were conducted during the peak recreation season at seven sites with associated subsites (Exhibit 3.8-1). These seven sites were chosen to provide an accurate description of the recreation activities and user frequency of visitors in all trails in the southern two-thirds of the park. Sites were set up so that the park could be broken up into smaller zones of use based on road/trail configurations. This allowed the surveyor to be able to record visitor use from multiple directions while being in a centralized location at each site, and to gain a better understanding of common routes in which visitors used. Initially in 2006, only sites 1, 2, and 7 had zones associated with them and site 6 had zones added part way through the survey period. In 2007, all sites had affiliated zones and visitors were counted on the forms in the zone through which they entered and exited. Some of these values might have counted the visitor twice, if they used an out and back route going through the same site/zone. These zones enabled State Parks to pin-point which roads and trails that were used the most, and gave general information about the typical routes visitors used. For instance, information gathered at site 6 indicated that the level of use differs within its affiliated zones. Table 3.8-1 below of the total people counted clearly shows the difference of user frequency within each zone for site 6 in 2006. This is an indication that users generally follow specific routes of connectivity (i.e., existing casual trails). Additionally, two winter informal, observational recreation user surveys were conducting in 2007 and 2008. State Parks personnel skied to survey sites and noted types and intensity of tracks present. Routes of tracks were also noted to identify key park entry areas.

Table 3.8-1
Total People Counted per Site/Sub-Zone for Weekdays and Weekends in 2006 and 2007

1A	1B	2A	2B	2C	3	4	5	6A	6B	6C	7A	7B	Total
51	25	43	99	12	14	31	112	25	25	5	89	18	549

Source: State Parks 2009

These survey sites were intended to provide a reasonable representation of the type, level, and frequency of recreation use in the study area. The personal interviews were intended to gauge where people entered Washoe Meadows SP and the route they use, why they chose to recreate in the park, and the frequency of their park use. Surveys were scheduled with approximately equal hours among each site, and surveys were allocated to morning, afternoon, and evening periods. Because of the lack of personnel resources, not all sites could be surveyed at the same time, and surveyors rotated sites according to the hours needed per site. Based on the varied recreational activities and the willingness of the public there were many more observational records than personal interviews completed. Data obtained from the personal interviews and observations are presented in the sections below.



Source: Data provided by EDAW (now AECOM) in 2008

Recreation Survey Locations **Exhibit 3.8-1**

Summary of Personal Interview Data

Interviews were conducted during on-site surveys and were mailed to all individuals on the interested public mailing list. The survey was also available on State Parks' project web site. Of all individuals interviewed on-site, 100 percent were local residents (i.e., people who reside in the Meyers/South Lake Tahoe area), and 86 percent of mail-in interviews were marked with a local zip code. To incorporate the access points that visitors used for recreating in Washoe Meadows SP with the recreation surveys, perimeter access areas (i.e., Survey Access Zones) were created along the boundary of the park property. These areas were outlined from key entry points into the park from the surrounding neighborhoods. Respondents were asked on both the on-site and mail-in forms from which area they entered/exited the park. Some visitors marked more than one area of entry in relation to where they live. Except for Zone E, marked by 5 percent of respondents, and the golf course, marked by 9 percent of the respondents, all other zones had a relatively equal share of responses.

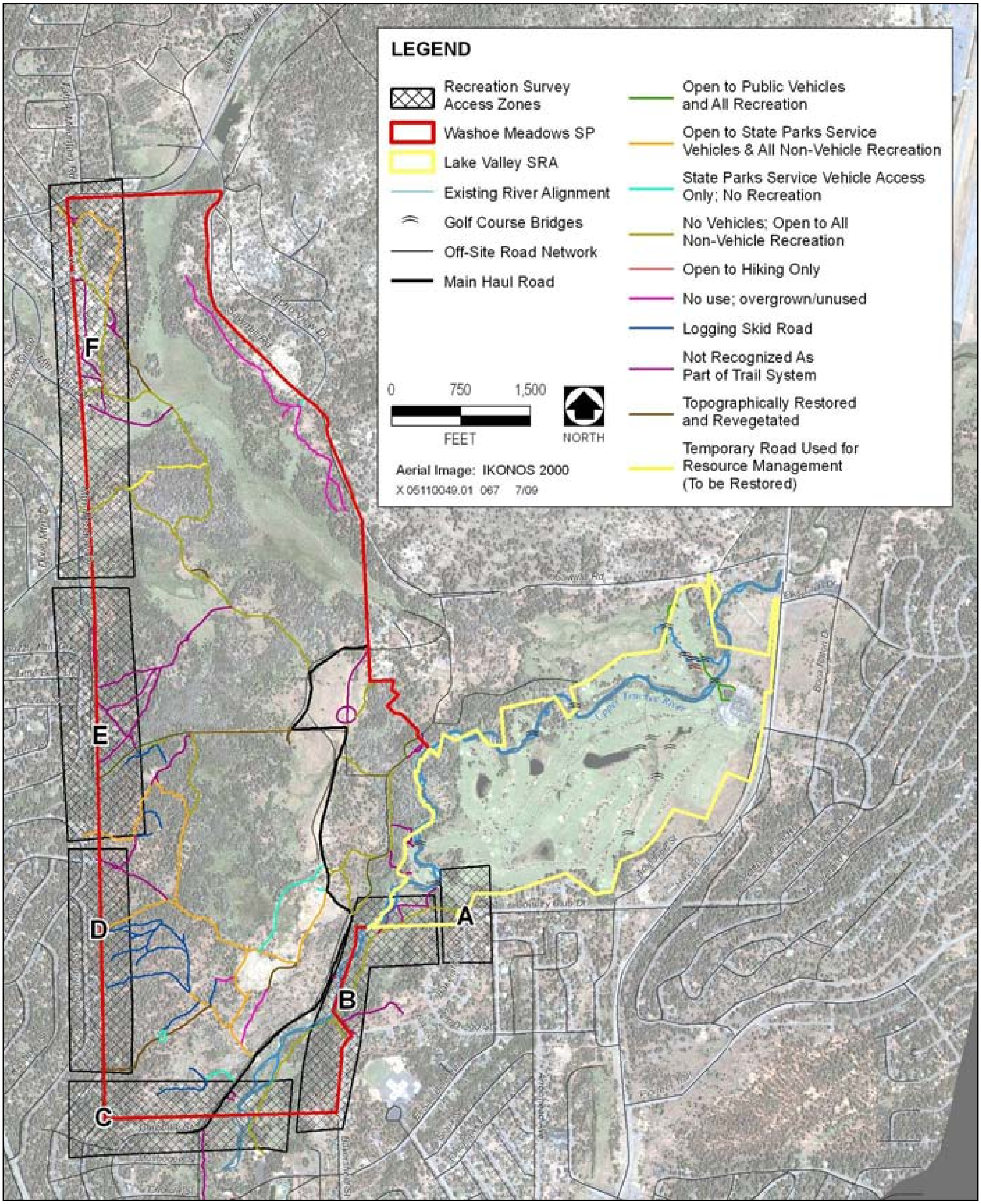
The heaviest park use is from the public residing in the neighborhoods surrounding the boundary of the property. Consequently, most respondents (86 percent) entered the park at locations nearest their homes in Survey Access Zones A, B, C, D, and F (Exhibit 3.8-2). Some visitors marked more than one area of entry in relation to where they live. Twenty percent entered through Zone A, 15 percent through Zone B, 13 percent through Zone C, 18 percent through Zone D, 5 percent through Zone E, 20 percent through Zone F, and 9 percent through the golf course. As might be expected due to the residential location of the majority of survey respondents, 42 percent indicated that they chose to recreate in Washoe Meadows SP because it is close to their home. Other reasons for recreating in the Washoe Meadows SP include ease of access and scenic beauty.

To gain a better understanding of areas of high use, visitors surveyed from the on-site interviews were asked to draw their primary routes on a map. For the mail-in interview forms, users were also asked to draw their primary destination or most often used routes with their area of entry/exit marked on the accompanied map. The results indicate that almost half of the people surveyed (47 percent) incorporate recreation survey point 5 (see Exhibit 3.8-1), which is next to the river, as their primary destination. Recreation survey points 2 and 7 include main routes through Washoe Meadows SP. This correlates with the high percentage of recreational users that access the study area from Zones A, B, C, or F. Recreation survey point 1 is used to access the hole 6 bridge at the Lake Tahoe Golf Course. Although there are five golf course bridges over the river, none of these are open to the public for recreation use because of safety concerns. However, most users entering Washoe Meadows SP from Zones A and B use the hole 6 bridge, which is accessible from Country Club Drive. In contrast, only 3 percent of recreational users chose recreation survey point 6 as their primary destination, and none chose recreation survey point 4.

Summary of Observation-Based Data

Data collected from the observation forms reveals that the heaviest used sites within the study area are sites 2, 5, and 7 (Table 3.8-2). Site 2 is in an area State Parks call "Dry Meadow"; the high level of use is probably because many trails and roads intersect within the site, some of which are used by visitors as connection routes to trails outside the park. It is also a centralized location for visitors coming or going to one side of the park from the other. Site 2 is also in the vicinity of the "old barn," which may serve as a destination for some visitors. Site 5 has a very popular user trail that parallels the Upper Truckee River on the east side. Many users from the adjoining neighborhoods use this trail as an out-and-back hike connecting to the USFS land adjacent to the southern boundary of Washoe Meadows SP or to access the hole 6 bridge at the Lake Tahoe Golf Course to cross the river. Site 7 includes a road that follows the sewer line manholes that traverse the park. The road provides service access for the South Tahoe Public Utility District (STPUD), as well as for State Parks. Many visitors use this road as a connecting route to access other casual trails or other areas within and beyond the park boundaries.

Data collected from the observation-based surveys also indicate that primary recreation uses of the trails within Washoe Meadows SP are walking and hiking (39 percent), and bicycling (36 percent). Jogging and horseback riding are also common uses (Table 3.8-3). Although no data was collected during periods of snow, cross-country ski and snowshoe tracks are also commonly visible in the study area, as well as illegal snowmobile activity (i.e., outside of the concessionaire-operated track on the driving range).



Source: Data provided by EDAW (now AECOM) in 2008

Recreation Survey Access Zones **Exhibit 3.8-2**

Table 3.8-2 Total Recreational Users Counted per Site for Weekdays and Weekends (2006–2007)						
	Site Number					
	1	2	4	5	6	7
Number of Recreational Users	76	152	32	112	55	107
Percentage of Total Recreational Users	14%	29%	6%	21%	10%	20%

Source: State Parks 2009

Table 3.8-3
Activity Totals Observed per Site for Weekdays and Weekends (2006-2007)

Activity	Total	Percentage
Hiking/Walking	209	39
Equestrian	81	15
Biking	190	36
Nature/Wildlife Viewing	0	0
Photography/Site Seeing	0	0
ATV/Motorcycle/Off-Highway Vehicle	1	<1
Jogging	30	6
Swimming	9	2
Fishing	0	0
Kayaking/Canoeing/Tubing	14	3
Nordic Skiing	0	0
Snowshoeing	0	0
Snowmobiling	0	0
Total	**534**	**100%**

Source: State Parks 2009

Lake Tahoe Golf Course

The Lake Tahoe Golf Course is located approximately 3.5 miles south of the South Lake Tahoe city limits on the west side of U.S. 50/State Route 89. The golf course is situated on State property within the Lake Valley SRA, a State Parks–managed site. Lake Tahoe Golf Course was constructed from 1958 to 1961 and owned and operated by a private enterprise, beginning in 1962. State Parks purchased the golf course in 1985, and the golf course has been operated by American Golf under a concessionaire contract with State Parks since 1989. As part of the preparation of this draft EIR/EIS/EIS, an extensive economic study of the golf course was prepared. Data regarding use of the golf course is drawn largely from that study (HEC 2008 [Appendix E]), as well as from user surveys conducted by State Parks personnel.

The Lake Tahoe Golf Course is a relatively low-priced, regulation-length golf course in the Lake Tahoe area. Maximum allowed prices are controlled by the contract with State Parks to ensure that the golf course remains affordable and available to general public. The course is generally open from April 15 to November 1 depending on weather and ground saturation conditions. It is a par 71, 18-hole regulation course that plays at 6,741 yards from the back tees. Amenities and features at the golf course include a grass driving range, putting and chipping practice greens, golf cart paths, five bridges that connect golf course holes northeast and southwest of the Upper Truckee River, a clubhouse, cocktail bar, restaurant, pro shop, snack bar, and a maintenance yard. The course also offers electric golf cart rentals, club rentals, and accommodates tournaments. The golf course hosts tournaments or "championship" play. The term, championship, is used to describe an 18-hole golf course that contains par 3, 4, and 5 holes, is over 6,000 yards for men and between par 70 to 73. The driving range, and putting and chipping greens are used by golfers to both warm up before playing a round, as well as to practice shots without playing a round. Throughout the year, the clubhouse hosts a variety of nongolf functions, such as weddings and banquets. According to the *Lake Tahoe Golf Course Economic Feasibility Study*, an average of approximately 37 such events have been held annually, and approximately 15 of these occur during the winter months (HEC 2008:19 [Appendix E]). The paved parking lot has 115 parking spaces, with parking also provided within unpaved areas on both sides of the golf course entrance.

Based on use data provided by the golf course concessionaire for 2006, the Lake Tahoe Golf Course generated approximately 76 full- and part-time jobs (on average), 60 percent golf-related and 40 percent for food and beverage-related services (serving both golfers and other events) (see Table 3.8-4). Concessionaire data from 2003 – 2006 indicated an average of 33,163 rounds of golf were played and 3,663 guests attended nongolf events each year. (Data from 2007 were not used to contribute to the baseline because of the Angora Fire that year, which caused the golf course to be closed for a substantial portion of the peak season.)

Table 3.8-4
Annual Facility Use at Lake Tahoe Golf Course

	Calendar Year					
Assumptions	2003	2004	2005	2006	Existing Average	Percent of Average
Number of employees						
Pro Shop				11	11	14%
Carts				7	7	9%
Maintenance				24	24	32%
Food and Beverage				31	31	41%
Administration				3	3	4%
Total Number of Employees				**76**	**76**	**100%**
Number of golf rounds played						
Regular Rounds	27,430	29,001	26,615	28,411	271,164	84%
Tournament Rounds	7,279	5,007	4,467	4,442	5,299	16%
Total Number of Rounds	**34,709**	**34,008**	**31,082**	**32,853**	**33,163**	**100%**
Events						
Number of Weddings	28	28	32	28	29	78%
Number of Banquets	5	10	7	11	8	22%
Total Number of Events	**33**	**38**	**39**	**39**	**37**	**100%**
Guests						
Guests at Weddings	2,920	2,780	3,727	2,935	3,091	84%
Guests at Banquets	410	611	389	880	573	16%
Total Guests at Events	**3,330**	**3,391**	**4,116**	**3,815**	**3,663**	**100%**

Source: HEC 2008 (Appendix E)

The Lake Tahoe Golf Course is particularly susceptible to variability in use levels as influenced by weather-related golf season length. The season beginning and end are dependent on snowmelt in the spring and when substantial snowfall and freezing temperatures occur in the fall, respectively. In addition, because of the high percentage of visiting golfers (i.e., golfers not residing permanently in South Lake Tahoe), the season length is also dependent on visitor use trends. Factors affecting visitation numbers include travel costs and the attractiveness/competitiveness of other visitor destinations. Facility use data show a trend of declining number of rounds played over the 4-year period. This trend is in line with a December 2005 retail market analysis of visitor lodging data, conducted for the City of South Lake Tahoe, which observed that the average annual occupancy rate of hotels, motels, and vacation rentals had declined significantly since 2000, slipping from 43 percent to 29 percent. The data also show increased visitation by guests, corresponding to an increased number of events held at the clubhouse (HEC 2008:19-20 [Appendix E]).

Golfing is considered a summer day-use activity in the TRPA Code. However, summer day-use PAOTs are not currently assigned to the golf course or any other summer day uses within the study area.

Lake Tahoe Golf Course Use Survey

During the 2007 and 2008 golf seasons, State Parks conducted a series of various surveys targeting the golfing community at the Lake Tahoe Golf Course. On-site surveys were conducted at the golf course by staging State Parks personnel at selected holes where golfers were given an opportunity to fill out a standardized form. In addition to the on-site surveys, the same survey form was also placed in the clubhouse of the golf course as extra coverage. State Parks also mailed out a similar survey form in 2007 to the local “Players Club” that is affiliated with the golf course in the hopes of reaching even more of the golfing population. A total of 322 complete surveys were collected during the 2-year period. Although the surveys represent responses from less than 1 percent of the total golfer population, they are still useful and informative about the golfer population and golfing preferences (HEC 2008:29 [Appendix E]).

The surveys revealed that approximately two-thirds of the golfers at the Lake Tahoe Golf Course are visitors from outside the area, and one-third of golfers are local residents (defined as residing in South Lake Tahoe area). Because the majority of golfers are visitors from outside the area, most golfers make five or fewer visits to the golf course per year. About 30 percent of the survey respondents play more than 16 times per year. If the players frequenting the course more than 16 times per year represent the local golfer population, then during the summer the local residents play golf more than three times per month. These local golfers are considered core golfers, or individuals who play eight or more rounds per year. The origins of golfers and number of visits are shown in Table 3.8-5.

The surveys also documented the reasons for choosing to play at Lake Tahoe Golf Course. The survey respondents’ primary reasons for playing at this golf course are convenience of the location and playing an 18-hole regulation course. Scenic beauty was chosen by 63 percent of the respondents as a reason for choosing this golf course, followed by course difficulty, and price.

Finally, the survey asked golfers what type of golf course they would play if the course were altered because of river restoration activities. Eighty-two percent of respondents said they would play a reconfigured 18-hole regulation course, with some holes relocated across the river. Eighty percent of the respondents said they would not play a 9-hole course. Similarly, 72 percent indicated they would not play an 18-hole executive course (HEC 2008:31 [Appendix E]).

Table 3.8-5 **Summary Statistics from 2007–2008 Lake Tahoe Golf Course User Survey by State Parks**				
	First Time Survey Respondent		Repeat Survey Respondent	
Survey Item	Total	Percent of Total	Total	Percent of Total
Origin of Golfers				
Number of Local Residents (South Lake Tahoe area)	103	32%	3	100%
Number of Out-of-Area Visitors	217	68%	0	0%
Total	**319**	**100%**	**3**	**100%**
Number of Visits per Year				
1–5	192	60%	0	0%
6–15	32	10%	2	66%
16+	86	27%	1	33%
No response	9	2%	0	0%
Total	**319**	**100%**	**3**	**100%**
Source: HEC 2008 (Appendix E)				

Lake Tahoe Golf Course Winter Recreation Activities

Consistent with permitted uses in the Lake Valley SRA, winter recreation activities also occur at the golf course. Winter recreation activities consist of organized snowmobiling within a track on the driving range (rental concession), informal public cross-country skiing, and snowshoeing within the golf course boundary. In the winter months, the driving range area of the golf course is used as a snowmobile track. Winter day-use PAOTs are not currently assigned to the snowmobile track or any other winter recreation uses within the study area. The public may rent snowmobiles from a concessionaire for 30-minute increments to ride around an oval track on the driving range. Snowmobile use is restricted to the driving range and snowmobiles are equipped with tracks that are designed only for groomed track use. American Golf has sublet the snowmobile operations since 2000, and executed a new sublease agreement with Sierra Mountain Sports for 2 years, beginning with the 2007–2008 winter season. Under the terms of the lease, rent is paid to American Golf at an increasing percentage as revenue increases. Typically, daily operations have been conducted by two or three employees; however, staffing is determined by projected demand (HEC 2008:23 [Appendix E]).

Snowmobiles are not permitted on any other areas of the golf course or Washoe Meadows SP, except when operated by staff for maintenance or patrol purposes. Staff periodically patrol the golf course and check snow conditions (HEC 2008:21 [Appendix E]). A high level of illegal snowmobile activity occurs within the golf course and Washoe Meadows SP. Although the Lake Tahoe Golf Course is not a designated cross-country ski area, cross-country skiing and snowshoeing are allowed throughout the course and are popular recreational activities.

Other Lake Tahoe Area Recreation

A variety of golf courses, parks, trails, river recreation, and winter recreation opportunities are available in the South Lake Tahoe area, as described below.

Golf

The following public golf courses are located in the greater South Lake Tahoe area:

- *Bijou Municipal Golf Course,* located in South Lake Tahoe, is a public par 32, 9-hole course. It plays at 2,002 yards from the white tees and is open from May 1 through October 31 (Lake Tahoe 2008).
- *Tahoe Paradise Golf Course,* located in Meyers, is a public par 66, 18-hole executive (nonregulation) course. On the short side, it plays at 4,034 yards from the white tees and is open from May 1 through October 15 (Lake Tahoe 2008).
- *Edgewood Tahoe Golf Course,* located in Stateline, Nevada, is a public par 72, 18-hole course. It plays at 6,365 yards from the white tees and is open from May 10 through October 14. Situated next to Lake Tahoe, Edgewood Tahoe Golf Course is known for its scenic beauty. Designed by George Fazio and opened in 1968, Edgewood is rated by Golf Digest Magazine as one of "America's Top Golf Courses." Edgewood has hosted a variety of major golf events throughout the years (Lake Tahoe 2008).

Parks

The South Lake Tahoe region has several park facilities available for public use: Bijou Community Park, El Dorado and Regan Beaches, South Lake Tahoe Parks and Recreation Complex, and athletic fields and playgrounds (City of South Lake Tahoe 2008):

- *Bijou Community Park* is South Lake Tahoe's only true community park (City of South Lake Tahoe 2008). Built in 1992, the park offers a top-rated disc golf course, gazebos, skateboard park, volleyball courts, fitness course, basketball court, horseshoe pits, and dog park.
- *El Dorado Beach* (and boat launch) is the largest beach area in South Lake Tahoe (City of South Lake Tahoe 2008). It offers a boat launch with floating dock, large turf and picnic areas, kayak and water toy concession, rope and buoyed swim areas, and a bike trail.
- *Regan Beach* offers a more tranquil setting than El Dorado Beach, with spectacular views of the lake. It includes a large grass area, sand volleyball court, playground, observation deck, and seasonal restaurant.
- *The South Lake Tahoe Parks and Recreation Complex* consists of a 25-yard indoor/outdoor year-round swimming pool, gymnasium, weight room, kitchen, crafts room, various meeting rooms, changing/shower facilities, outdoor volleyball and basketball courts, picnic area, and Parks and Recreation Department offices.
- *The 13 athletic fields* in the South Lake Tahoe area include a regulation, synthetic-turf soccer/football field; a new full-size, synthetic-turf soccer field with a nine-lane track; a Little League field complex; a full-size baseball field; and athletic fields open to multipurpose use (e.g., softball, football, soccer).

Trails

Many high-quality trails in the South Lake Tahoe region are available on public land for a variety of nonmotorized uses including hiking, mountain biking, and horseback riding. Outside of the State Parks properties, most public trails are located on National Forest lands managed by USFS. The most famous of these is the Tahoe Rim Trail, a 165-mile trail that forms a loop around Lake Tahoe, providing hiking, horseback riding, and Nordic skiing. Mountain biking is allowed on approximately half the trail, but several segments do not allow mountain biking, particularly those segments that overlap the Pacific Crest Trail, which does not allow mountain biking (TRTA 2008).

The Sawmill bike path currently runs along U.S. 50 and is adjacent to part of the Lake Tahoe Golf Course. The bike path is planned to extend along the north boundary of the golf course on Sawmill Road in the future and continue into South Lake Tahoe at U.S. 50, near Sawmill pond. The Pacific Crest Trail runs approximately 2,650 miles from Mexico to Canada, through California, Oregon, and Washington. The trail is designated as nonmechanized and open only to foot, horse, and pack travel. Near the study area, the Pacific Crest Trail can be accessed along U.S. 50 near Echo Summit (PCTA 2008). Most other nonmotorized trail opportunities near the study area are associated with Eldorado National Forest. Several trail opportunities also are available in the Desolation Wilderness area; however, no mechanized travel (i.e., biking) is allowed in wilderness areas (USFS 2006).

River Recreation

River recreation occurs on many reaches of the Upper Truckee River in addition to the area within Washoe Meadows SP and Lake Valley SRA. Most river recreation in the project vicinity that is not associated with the Upper Truckee River occurs on the Truckee River below Lake Tahoe, where recreational opportunities include kayaking, rafting, fishing, and swimming. Many small creeks and tributaries are located throughout the Eldorado National Forest and Desolation Wilderness area that provide good fishing opportunities (USFS 2006).

Winter Recreation

Winter recreation opportunities in the South Lake Tahoe area include snowshoeing, snowmobiling, skiing, snowboarding, sledding, and snow play. Skiing and snowboarding in the South Lake Tahoe area is available at Heavenly Mountain Resort, snowshoeing and cross-country skiing are available at Camp Richardson, and snowmobiling is provided by Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling (Tahoe 360.com 2007).

3.8.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of Federal, State, and local agencies.

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, an alternative would result in a significant impact on recreation if it would:

- increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated, or

- include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

In addition, in light of the purpose statements for the State Park units, an alternative was determined to result in a significant effect on recreation resources if it would:

- substantially reduce authorized recreational opportunities or substantially degrade recreational experiences for authorized activities.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on the TRPA Initial Environmental Checklist Form, an alternative would result in a significant recreation impact if it would:

- create substantial, unmet additional demand for recreation facilities;
- have the potential to create conflicts between recreation uses, either existing or proposed;
- result in a decrease or loss of public access to any lake, waterway, or public lands; or
- result in a reduction of public access to public recreation areas or public recreation opportunities.

In addition, an alternative was determined to result in a significant impact if it would:

- be inconsistent with the *Lake Tahoe Regional Bicycle and Pedestrian Master Plan* (TRPA 2006).

METHODS AND ASSUMPTIONS

For purposes of this analysis, the study area is generally confined to the community of South Lake Tahoe, California. The analysis of PAOT capacity was evaluated recognizing that for any alternative, PAOTs are available for allocation from the reserve pool and that they would be assigned to the Lake Tahoe Golf Course, even under the No Project/No Action Alternative (Alternative 1) for continuation of existing recreation uses. .

IMPACTS FOUND NOT TO BE SIGNIFICANT AND NOT DISCUSSED FURTHER

Lake Tahoe Regional Bicycle and Pedestrian Master Plan (2006) – The Lake Tahoe Regional Bicycle and Pedestrian Master Plan does not identify any officially established or designated trails in the study area (TRPA 2006: Appendix A, Figure 9). In addition, none of the alternatives would affect or preclude the construction of proposed bike routes for neighborhoods east, west, and north of Washoe Meadows SP and Lake Valley SRA that are identified in the plan (TRPA 2006: Figure 8, Appendix A). Because the project would not affect any existing trails identified by the Lake Tahoe Regional Bicycle and Pedestrian Master Plan and would not preclude construction of trails proposed in the plan, this topic is not discussed further.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action—Existing River and 18-Hole Regulation Golf Course

IMPACT 3.8-1 (Alt. 1)

Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf. *No new facilities are proposed under Alternative 1; however, repairs to the river or golf course could reduce golfing opportunities in the short term. These effects are expected to be temporary and minor, and no long-term effects on golfing opportunities would occur. This impact would be* less than significant*.*

Under Alternative 1, existing conditions in the study area would continue into the future. The reach of the Upper Truckee River within the study area would not be restored and would continue to erode and transport sediment to Lake Tahoe, and the 18-hole regulation golf course would remain in its current location and condition. Repairs to the river and golf course would continue on an emergency or as-needed basis. Future repairs to the river and golf course could require temporary closures of portions of the golf course, resulting in temporarily reduced golfing opportunities. However, these changes would be short in duration and minor in area affected, and the risk that repairs would be needed is the same as current conditions.

Alternative 1 would not include any new facilities or changes to existing facilities that would result in long-term effects on golfing opportunities.

Because short-term construction activities associated with this alternative (i.e., ongoing repairs to river banks, as needed) would be temporary and minor, and no long-term changes to golfing opportunities in the study area would occur, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-2 (Alt. 1)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Spring/Summer/Fall Dispersed Outdoor Recreation. *No new facilities are proposed under Alternative 1; however, future repairs to the river or golf course could result in short-term effects on dispersed outdoor recreation during the spring, summer, and fall. These effects would be temporary and minor, and no long-term effects on recreation opportunities would occur. This impact would be* ***less than significant****.*

Under Alternative 1, existing conditions in the study area would continue into the future. Repairs to the river would continue on an emergency or as-needed basis. Short-term construction-related effects on dispersed outdoor recreation during the spring, summer and fall would not be likely to occur as a result of future repairs to the river within the golf course, because dispersed activities typically take place outside the golf course. In the short-term, future repairs requiring construction activities within and adjacent to the river where other recreation activity occurs would affect primarily water-related recreation and trails along the river. However, these changes would be temporary and minor.

Alternative 1 would not include any new facilities or changes to existing facilities that would result in long-term effects on spring, summer, or fall outdoor recreation opportunities.

Because short-term construction activities associated with this alternative would be temporary and minor, and no long-term changes to spring/summer/fall outdoor recreation opportunities in the study area would occur, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-3 (Alt. 1)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Winter Recreation. *No new facilities are proposed under Alternative 1 that would result in short-term or long-term effects on winter recreation. In addition, future repairs to the river or golf course would not likely occur during the winter season and would not disturb areas used for winter recreation. Therefore,* ***no impact*** *would occur.*

Under Alternative 1, repairs to the river and golf course would continue on an emergency or as-needed basis. Repairs to the river would not occur during the winter season unless deemed emergency repairs, and emergency repairs to the river would not affect areas used for winter recreation activities. In addition, the golf course would not be repaired during the winter season. Therefore, short-term construction-related effects associated with future repairs to the river and golf course would not adversely affect winter recreation opportunities.

Alternative 1 would not include any new facilities or changes to existing facilities that would result in long-term effects on winter outdoor recreation opportunities. Snowmobiling would continue to be allowed at the driving range area, and State Parks staff members would continue to periodically patrol for illegal snowmobiling within other areas of the golf course and Washoe Meadows SP. Both activities are the same as occur under existing conditions.

Future repairs associated with this alternative would occur either outside of the winter recreation season or outside of the areas used for winter recreation. No short term or long term changes to winter recreation opportunities would take place. Therefore, no impact would occur.

No mitigation is required.

IMPACT 3.8-4 (Alt. 1)	**Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Vicinity of the Study Area.** *Alternative 1 would result in the short-term loss of recreation opportunities in the study area during repairs. However, this alternative would not include any new facilities or changes to existing facilities that would result in long-term changes to recreation facility use, recreation demands, or PAOT capacity. This impact would be* ***less than significant****.*

Alternative 1 could result in reduced opportunities for golfing and spring/summer/fall outdoor recreation in the short term during future repairs to the river or golf course. Therefore, the demand for golfing and spring/summer/fall outdoor recreation opportunities in the study area could increase during future repairs. This increased demand would be temporary and would likely be met by a variety of other recreational facilities in the surrounding area, and thus would not cause physical deterioration of any one facility. The impact associated with short-term increases in demand for or use of recreational facilities would be less than significant.

Alternative 1 would not result in any long-term changes to the existing recreation facilities within the study area. Therefore, the use of recreation facilities in the study area would not increase under this alternative. PAOTs are not currently assigned to the Lake Tahoe Golf Course golfing or snowmobiling activities. It can be expected that PAOTs would be assigned to these uses under Alternative 1. Illegal snowmobile activities within the golf course and Washoe Meadows SP would not be assigned PAOTs and State Parks would continue to patrol these areas. Demand for recreational opportunities is expected to fluctuate over time based on factors such as population growth, economic conditions, changes in recreational opportunities, and season. Alternative 1 would not increase long-term demand for recreational opportunities, and future demand is expected to fluctuate as under current and past conditions. Effects on PAOTs capacity would not change from existing conditions. PAOTs are available for allocation from the existing reserve.

Because short-term increases in demand may not occur or would be temporary and Alternative 1 would not result in any new long-term recreational facilities, changes to existing facilities, or needed PAOT capacity this impact would be less than significant.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.8-1 (Alt. 2)	**Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf.** *Construction associated with Alternative 2 would temporarily reduce golfing opportunities on the existing golf course for a two-year construction period; however, other 18-hole courses are available in the region to provide golfing opportunities during this temporary construction disruption. Long-term golfing opportunities under this alternative would be similar to existing conditions after completion of the reconfigured 18-hole golf course. This impact would be* ***less than significant****.*

Under Alternative 2, construction would be phased over a 3- to 4-year period between May 1 and October 15 in each year, beginning in 2012. During Year 1 of construction, golf play would be limited to a 9-hole course on the east side of the river to allow for construction access adjacent to the river. In Year 2, golf play would be either completely shut down or located on the western nine holes constructed in Year 1, if vegetation is properly established. The reconfigured 18-hole regulation golf course would be open to play in Year 3, with possible minor short-term modifications to allow for construction access to the river.

Although golfing opportunities within study area would be reduced during Years 1 and 2 of construction, two other 18-hole golf courses (Tahoe Paradise Golf Course and Edgewood Tahoe Golf Course) and the 9-hole Bijou Golf Course, all located within a 15-mile radius of the study area, would be open for play during construction. Within a 60-minute drive of the South Lake Tahoe area there are also eight other competitive golf courses (i.e., public 18-hole golf courses and/or 18-hole golf courses that offer a similar experience to the Lake Tahoe Golf Course in terms of aesthetic appeal) (HEC 2008:32–33 [Appendix E]). In addition, reduced golfing opportunities during construction of Alternative 2 would be temporary.

The current Lake Tahoe Golf Course is an 18-hole regulation length, par 71 course with a total walking distance of 6,741 yards. The current course has three sets of tees at 6,742, 6,327, and 5,702 yards, respectively. The course rating and slope for the three tees are 70.8/126, 68.9/120, and 66.7/109, respectively.

Under Alternative 2, the reconfigured golf course would incorporate and improve sections of the existing golf course. Two new holes that cross the river and seven new holes on the west side of the river would be constructed, removing the existing golf course from areas adjacent to the river. All existing cart paths that are not within the footprint of the reconfigured golf course would be removed, and the area would be restored to natural topography and vegetation.

The portion of the course on the west side of the river would be designed with maintained turf areas surrounded by native vegetation. This concept creates more target-style golf, in which wider turf areas are placed only in main landing zones (fairways through greens), so that manicured vegetation is thin near the tees and minimized overall. The footprint of the golf course in Alternative 2 would be 156 acres versus the existing 133-acre footprint; however the intensively managed area is less than the existing golf course (92 acres versus 103 acres). The conceptual design for the reconfigured course would maintain its status as an 18-hole regulation course designed to host championship play, with approximately the same yardage and par as the existing course. The design intent is to keep the course's slope and rating similar to its current status for existing tee lengths. The same levels of challenge and playability offered by the current course would be maintained.

The reconfigured golf course would continue to operate from approximately April 15 to November 1 (weather permitting) from dawn until dusk, and would continue to host a variety of golf tournaments and outings each year. There is no anticipated change in tournament play frequency or fees under this alternative, except those that may arise in the normal course of business in accordance with the golf course's business plan.

As discussed in the *Lake Tahoe Golf Course Economic Feasibility Analysis*, approximately two-thirds of rounds played were made by visitors to the area (HEC 2008:29–30 [Appendix E]). Of the estimated 22,219 rounds played by visitors, 8,942 rounds were estimated to be made by visitors whose specific purpose for visiting the Tahoe Basin was to play golf at the Lake Tahoe Golf Course. According to the State Parks' Golf Course use survey, 82 percent of the survey respondents indicated that they would play a modified regulation 18-hole course even if some holes were relocated across the river.

Although Alternative 2 would change the existing golfing experience at the Lake Tahoe Golf Course, this change is not considered adverse. The proposed reconfigured, regulation-length 18-hole golf course would maintain its level of challenge and playability, and the existing hole lengths, slopes, and ratings would be matched to the extent possible. The proposed reconfigured golf course would be capable of providing an exacting level of challenge and excellent playing conditions with the ability to host championship play for talented amateur and professional golfers in regional, state, and national competitions, as are provided by the current course.

In addition, the unpaved parking area north of the golf course entrance would be paved to create an additional 89 parking spaces. Paving and other construction activities would be temporary and minor and would not change the existing use. No changes to the clubhouse or maintenance facilities are proposed.

Because short-term reductions in golfing opportunities would be temporary and golfing opportunities would not be reduced in the long term, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-2 (Alt. 2)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Spring/Summer/Fall Dispersed Outdoor Recreation. *Alternative 2 would result in the short-term disruption of spring, summer, and fall dispersed outdoor recreation opportunities in the study area during construction. In addition, there would be long-term changes to the existing informal trail system. However, new trails would be constructed that would maintain similar recreation opportunities to existing conditions and water-related recreation would continue after construction. Therefore, this impact would be* less than significant.

Alternative 2 would affect all or large portions of Recreation Use Zones 1A, 1B, 4, 5, 6, 7A, and 7B (Exhibit 3.8-1). Combined, these zones accommodate approximately 71 percent of all recreation use that currently occurs in Washoe Meadows SP. More specifically, these zones accommodate 82 percent of hiking/walking, 63 percent of biking, 76 percent of jogging, and 51 percent of equestrian use that occurs in Washoe Meadows SP.

Currently, all the trails on the west side of the river are casual or volunteer trails that have been formed by trail users over time through routine dispersed recreational use or unpaved roads that have been adopted for trail use. Current practices include decommissioning casual and volunteer trails where State Parks deems inappropriate due to effects on water quality or vegetation. Volunteer trails are not maintained by State Parks. Service roads are maintained to allow access for STPUD vehicles. The Upper Truckee River is used seasonally, primarily during the spring and summer, for sunbathing, swimming, fishing, and nonmotorized watercraft activities (kayaking and canoeing). Trout fishing season typically extends from July 1 through October 1.

Construction of Alternative 2 would overlap with the spring/summer/fall recreation season (i.e., May 1–October 15) in all 3–4 years of construction, which would result in reduced spring, summer, and fall outdoor recreation opportunities throughout the construction period. In Year 1, construction would focus on the new golf course holes on the west side of the river, which would interfere with use of existing volunteer trails and service roads within the proposed footprint of the relocated golf course in Washoe Meadow SP, as well as some areas adjacent to the river and areas where off-channel work is proposed. Year 2 of construction would involve reconfiguring the existing golf course for play in Year 3, which would affect trail use and water recreation on the Upper Truckee River and trail use adjacent to the existing golf course. Year 3 would involve removing of bridges, completing in-channel work, and connecting historic meanders and new channel sections; these construction activities would also interfere with water-related recreation and use of some volunteer trails and service roads.

Although access to trails and water recreation opportunities in the study area would be reduced during construction, numerous other trails exist in the remainder of Washoe Meadows SP, nearby USFS lands, and elsewhere in the South Lake Tahoe region, and water recreation opportunities along other segments of the Upper Truckee River would be available during construction. To the extent feasible, measures to maintain pedestrian access to trails and river access within the study area would be implemented, and signage would be posted before construction to notify visitors of trail closures.

After construction under Alternative 2, approximately 2.6 miles of existing volunteer trails within Washoe Meadows SP and all of the existing bridges within the existing golf course (except the four cart path bridges along the unnamed creek) would be permanently removed to accommodate the reconfigured golf course on the west side of the river or restoration of the river. However, new designated trails and a new bridge would be constructed to connect the informal dispersed-recreation trails on the west side of the river to new trails on the east side of the river (refer to Exhibit 2-5 in Chapter 2, "Project Alternatives"). The recreation trail would share the new bridge with the golf cart path and would then diverge into separate paths on both sides of the river. The new bridge would be the first river crossing on the State Park lands built with the intent of supporting authorized dispersed outdoor recreation in a safe manner, avoiding conflicts with golf play; the existing golf course bridges are designed only for golfer use and nongolf pedestrian or bicycle use is not authorized for safety reasons. Two new recreation trails on the east side of the river would connect to the bridge. One would extend to the south and tie into the corner of Country Club Drive and Bakersfield Street, while the other would extend along the south side of the river to the east and tie into the new Sawmill Bike Path along U.S. 50 near the clubhouse. That trail would cross the unnamed creek on an existing golf course bridge that would no longer be within the reconfigured course; the trail would also require sections of boardwalk through the restored floodplain.

A new trail would also be constructed around the north end of the western section of the golf course, allowing access to the east side of the river across the new bridge. The trail would share the cart path in the central area of the western holes where a gap in the golf course would provide a corridor for other recreation users to pass through to the river and tie into the existing gravel road that parallels the river. This proposed trail configuration would enable public access and use into and within this portion of the study area. A section of the new cart path route would also serve as a walking trail on the west side of the river to provide nongolf recreation access across the golf course and to the new bridge.

In total, approximately 1.4 miles of new designated trails would be created as part of Alternative 2. Alternative 2 would not replace the entire length of informal trails that would be removed; however, the new designated trails would be maintained and would provide better connectivity through the study area than the existing trails. Therefore, the new trails would be of higher quality than the volunteer trails that would be removed and would maintain similar recreation opportunities. The new portion of the reconfigured golf course would remove 23 acres of Washoe Meadows SP from other recreational uses; however, Washoe Meadows SP is 620 acres in total and dispersed recreation would continue throughout the remainder of the state park and portions of the Lake Valley SRA.

The golf course bridges that would be removed do not provide authorized public access; however, they often experience unauthorized use by outdoor recreationists. Unauthorized use of these bridges results in an existing use conflict between golfers and other recreation users and is a safety hazard. Although removing these bridges would reduce unauthorized access across the river, authorized access across the river would be enhanced with the completion of the proposed bridge. Alternative 2 would include a new bridge that would provide authorized and safe, nongolf public access across the river, as well as support golfer access to the holes on the west side of the river.

In addition, the river would be restored after construction, and water-related recreation (e.g., swimming, kayaking, fishing) along the Upper Truckee River would continue informally in the study area after completion. Furthermore, by providing trail access along the Upper Truckee River, in areas which were formerly occupied by golf course, fishing access to the river would be improved by Alternative 2.

In summary, construction-period disruption of dispersed recreation would be temporary. New trails would continue to provide long-term recreation opportunities within the study area similar to existing recreation opportunities, and authorized access across the river would be enhanced by the new bridge. Water-related recreation would continue after construction. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-3 (Alt. 2)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Winter Recreation. *Existing snowmobile recreation would be unavailable within the study area in the short term because the snowmobile track area would be used for construction staging. No other short-term or long-term changes would affect existing outdoor winter recreation opportunities, use, or experiences such as cross-country skiing, snowmobiling, and snowshoeing. This impact would be* ***less than significant****.*

Consistent with permitted uses in the Lake Valley SRA, winter recreation activities consist of concessionaire-operated snowmobiling on the driving range and informal public cross-country skiing and snowshoeing within the golf course boundary. Cross-country skiing and snowshoeing are also popular informal uses within Washoe Meadows SP. The golf course's driving range is used as a snowmobile track during the winter. Although snowmobile use is restricted to the driving range and staff periodically patrol the golf course, a high level of illegal snowmobile activity occurs within the golf course and Washoe Meadows SP (HEC 2008:21 [Appendix E]).

Although construction activities would occur in the study area over a 3- to 4-year construction period, active construction would take place only between May 1 and October 15. The winter recreation season begins in December and ends in April. Therefore, construction would be completed each year before the start of the winter recreation season and would not resume until after the winter recreation season. The snowmobile track at the golf course would be closed during the construction season because the driving range is the main construction staging area for the proposed project. However, this closure is short-term (3–4 years) and snowmobiling would be available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling during the construction period.

After construction, winter recreation opportunities would continue to occur in the study area from December through April. Cross-country skiing and snowshoeing would continue to be available throughout the study area on an informal basis. Snowmobiling would remain limited to the existing Lake Tahoe Golf Course driving range and would not be allowed within the reconfigured golf course on the west side of the river or within Washoe Meadows SP. Snowmobile operations would continue to be provided by an outside vendor.

Construction activities would be short-term and would not substantially affect winter recreation opportunities available in the area, and there would be no long-term changes to winter recreation. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-4 (Alt. 2)	Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Vicinity of the Study Area. *Alternative 2 would result in the short-term loss of recreation opportunities in the study area during construction. After construction, the golf course would be reconfigured and would offer golfing opportunities similar to those of the existing golf course. All other outdoor recreation opportunities would continue in the study area in the long term. This change to the golf course would not increase the long-term demand for recreational facilities or use of any other recreational facilities, and continuation of existing recreational uses would use PAOTs from the existing PAOT reserve pool. This impact would be* ***less than significant****.*

Alternative 2 would result in reduced opportunities for golfing and other spring/summer/fall outdoor recreation in the short term. Therefore, demand for golfing and other spring/summer/fall outdoor recreation could temporarily increase for other facilities during the construction period. This increase would be temporary and would likely be dispersed among other recreational facilities in the surrounding area, and, therefore, would not cause physical deterioration of any one facility. Short-term demand and increases in use of recreational facilities would be less than significant.

In the long term, Alternative 2 would involve reconfiguration of the existing golf course. The reconfigured golf course would offer comparable challenge and playability to the current golf course. According to the Lake Tahoe Golf Course Economic Feasibility Analysis (HEC 2008), reconfiguration of the Lake Tahoe Golf Course under Alternative 2, it is estimated that the number of rounds, generated visitors and spending would remain essentially the same as current conditions.

Other outdoor recreation opportunities would continue in the study area after construction. Furthermore, numerous other areas of public land already used for outdoor recreation are widely available and used by residents of the area. Alternative 2 would not result in a substantial increase in use of any recreational facilities, because Lake Valley SRA and Washoe Meadows SP would continue to provide similar golf and dispersed outdoor recreation opportunities. Outdoor recreation opportunities provided within the study area would be similar to existing opportunities (i.e., trails, river access, forest areas) and Alternative 2 would not cause a substantial increase in demand for other recreation areas.

Currently, no PAOTs are assigned to recreational facilities within the study area. Continuation of existing recreation opportunities in the study area would likely result in assignment of PAOTs, as would occur under Alternative 1, because the number of rounds are expected to be essentially the same as under existing conditions. The Upper Truckee River Restoration and Golf Course Reconfiguration Project qualifies under the EIP for PAOT allocation from the existing pool (6,215 available for summer-day use and 7,927 available for winter-day use [TRPA 2007: 10-9]) available for the Golf Course and for the driving range snowmobile uses. Therefore, Alternative 2 would not have an adverse effect on PAOT capacity for the study area or Tahoe Basin.

Because short-term increases in demand on other recreation areas would be temporary, Alternative 2 would not result in an increase in long-term use or demand for recreation opportunities, and the project qualifies under the EIP to use existing unassigned PAOTs from the reserve pool, this impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced-Play Golf Course

IMPACT 3.8-1 (Alt. 3)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf. *Alternative 3 would result in the short-term loss of golf play in the Lake Valley SRA during construction. In addition, the existing 18-hole regulation golf course would be reconfigured to a regulation-length 9-hole or 18-hole executive course, which would permanently reduce golfing opportunities in the study area. This impact would be significant.*

Implementation of Alternative 3 would require construction activities and scheduling similar to those for Alternative 2. Golf play would be limited to a 9-hole golf course on the east side of the river in Year 1 of construction to allow construction access adjacent to the river. In Year 2 of construction, golf play would be completely shut down for modification of the existing course. Year 3 would include removal of bridges, in-channel work, and connection of historic meanders and new channel sections.

Alternative 3 would temporarily reduce golfing opportunities during the construction period. As discussed for Alternative 2, within a 15-mile radius of the study area, one 18-hole executive golf course, one 18-hole regulation golf course, and the 9-hole Bijou Golf Course would be open for play during the construction period. Within a 60-minute drive of the South Lake Tahoe area there are eight other competitive golf courses, defined as public 18-hole golf courses and/or 18-hole golf courses that offer a similar experience to the Lake Tahoe Golf Course in terms of aesthetic appeal (HEC 2008:32–33 [Appendix E]). In addition, construction-related effects would be temporary.

Under Alternative 3, the golf course would be reconfigured to a regulation 9-hole course or an 18-hole executive course. Under either scenario, Alternative 3 would provide reduced golfing opportunities in the study area in the long term, because of the loss of the regulation-length, 18-hole facility. If the existing golf course were reconfigured to a regulation-length 9-hole course, the reconfigured course would follow the same criteria as the existing 18-hole course. The layout of tees, fairways, and greens would be very similar to numerous holes in the current layout of the 18-hole course, because nine holes could fit on the southeast side of the river and be situated outside of sensitive zones. The lengths, slopes, and ratings would be roughly half those of the 18-hole regulation-course. A reduced-play area course would not maintain golfing opportunities and quality of play, and would not be capable of hosting tournament play.

If the existing golf course were reconfigured to an executive course, it would consist of 18 shorter playing holes that would range in par from 48 to 68. Total yardage would be between 3,000 and 4,500 yards. Executive golf courses typically consist of par-3 and par-4 holes only and require less area than a regulation golf course. The same level of challenge and playability that the existing course offers would not be maintained under the executive course scenario. Therefore, an executive course would also not maintain golf recreation opportunities and quality of play, and would not be capable of hosting tournament play.

As discussed in the *Lake Tahoe Golf Course Economic Feasibility Analysis*, 80 percent of survey respondents indicated they would not play a 9-hole course, and 72 percent said they would not play an 18-hole executive course with all the holes located on the east side of the river. As stated in the survey, 79 percent chose to play the Lake Tahoe Golf Course, because it is a regulation 18-hole golf course and because of its convenient location. The economic feasibility analysis indicated that the survey respondents were likely to have been biased regarding proposed changes to be made to the golf course; a reduced-play golf course would likely appeal to a different group of golfers (HEC 2008:30–31 [Appendix E]).

Although golfing opportunities would still exist under Alternative 3, the existing golf experience at the Lake Tahoe Golf Course would be substantially reduced. Alternative 3 would not maintain golfing opportunities and quality of play, nor tournament or championship play. Therefore, this impact would be significant.

As discussed in Chapter 2, "Project Alternatives," the comprehensive evaluation of potentially feasible alternative locations for the golf course determined that no feasible alternative location for an 18-hole regulation golf course is available. Therefore, no feasible mitigation is available to reduce Impact 3.8-1 (Alt. 3) to a less-than-significant level. The impact would remain significant and unavoidable.

IMPACT 3.8-2 (Alt. 3)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Spring/Summer/Fall Dispersed Outdoor Recreation. *Alternative 3 would result in the short-term loss of recreation opportunities such as trail use and water-related recreation in the study area during the spring, summer, and fall. However, construction-related effects would be temporary. In addition, no long-term changes to spring, summer, and fall recreation opportunities would occur. Therefore, this impact would be* ***less than significant.***

Short-term effects on spring, summer, and fall dispersed outdoor recreation opportunities would be similar to effects described in Impact 3.8-2 (Alt. 2), because construction phasing would be similar for both alternatives. However, Alternative 3 would not include construction on the west side of the river outside of the historic meander belt. Short-term effects on volunteer trails and service roads within Washoe Meadows SP would be less than under Alternative 2; only trails adjacent to the Upper Truckee River and the use of the STPUD access road would be affected. Furthermore, removal of bridges, in-channel work, and connection of historic meanders and new channel sections under Alternative 3 would temporarily interfere with water-related recreation on the Upper Truckee River such as fishing, swimming, and kayaking.

Under Alternative 3, the design for the Upper Truckee River would be the same as under Alternative 2 except that Alternative 3 would not include any bridges over the river. All five golf course bridges would be removed from the Upper Truckee River; however, the four golf cart bridges over the unnamed creek would remain, with the northernmost bridge designated for trail use. In addition, the confluence of Angora Creek would be reconfigured and four cart path bridges would be removed. Approximately 0.75 mile of casual trails would be removed under Alternative 3 and a designated and maintained pedestrian trail would be established along the northern edge of the proposed reduced-play golf course. This designated trail would run from U.S. 50 just north of the golf course entrance to Country Club Drive, with a tie-in to the Sawmill Bike Trail and would create approximately 1 mile of new trail.

The existing golf course bridges that would be removed under Alternative 3 are used for unauthorized access between Washoe Meadows SP and Lake Valley SRA. This unauthorized access across the river would be eliminated under this alternative; however, because the access is not authorized and is actively discouraged by State Parks (as a result of safety concerns for nongolf users on a golf course), the removal of the bridges would not cause a significant loss of authorized, public recreational access. Public access to Washoe Meadows SP would remain at the end of several streets. Also, access across the river is provided by the Sawmill multi-use trail adjacent to U.S. 50.

No golf course holes would be relocated to the west side of the river; therefore, no new trails would be constructed within Washoe Meadows SP under this alternative.

In addition, the river would be restored and water-related recreation (e.g., swimming, kayaking, fishing) along the Upper Truckee River would continue informally in the study area after construction. Furthermore, by providing trail access along the Upper Truckee River, in areas which were formerly occupied by golf course fishing access would be improved by Alternative 3.

Short-term effects on spring, summer, and fall outdoor recreation would be temporary, and no long-term effects on authorized outdoor recreation opportunities would occur; therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-3 (Alt. 3)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Winter Recreation. *Existing snowmobile recreation would be unavailable within the study area in the short term because the snowmobile track area would be used for construction staging. No other short-term or long-term changes would affect existing outdoor winter recreation opportunities, use, or experiences such as cross-country skiing, snowmobiling, and snowshoeing. This impact would be* ***less than significant****.*

This impact is the same as Impact 3.8-3 (Alt. 2) because short-term effects of Alternative 3 would be limited to closure of the snowmobile track within the driving range. However, snowmobiles would be available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling during the construction period and operations on the driving range would resume following construction. As under Alternative 2, no other short-term or long-term effects on outdoor winter recreation would occur. This impact would be less than significant.

No mitigation is required.

IMPACT 3.8-4 (Alt. 3)	Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Vicinity of the Study Area. *Alternative 3 would result in the short-term loss of recreation opportunities in the study area during construction. After construction, the existing Lake Tahoe Golf Course would be reduced to a 9-hole or 18-hole executive golf course, which would reduce the golfing opportunities provided by the course. In the long term, all other outdoor recreation opportunities would remain available in the study area, as under existing conditions. Reduced golfing opportunities in the short term and long term could increase the use of other 18-hole regulation golf courses in the area; however, this increase in use is expected to be dispersed. In addition, because no PAOTs have been assigned to the study area, PAOTs would be assigned from the existing PAOT reserve pool under Alternative 3. Therefore, this impact would be* ***less than significant****.*

Alternative 3 would result in reduced opportunities for golfing, spring/summer/fall outdoor recreation, and winter outdoor recreation in the short term. Therefore, demand for these activities could increase during the construction period. This increase would be temporary and would likely be dispersed among other recreational facilities in the surrounding area, and therefore would not cause an increase in physical deterioration of any one facility. The effects of short-term demand and increases in use of recreational facilities would be less than significant.

Under Alternative 3, the existing golf course would be reduced to a 9-hole or 18-hole executive golf course after construction. The same level of challenge and playability offered by the existing course would not be maintained under either scenario. A 9-hole or executive course would not maintain golf recreation opportunities and quality of play, nor tournament or championship play.

As discussed in the Lake Tahoe Golf Course Economic Feasibility Analysis, 80 percent of survey respondents indicated they would not play a 9-hole course, and 72 percent said they would not play an 18-hole executive course with all the holes located on the east side of the river (HEC 2008:31 [Appendix E]). Therefore, it is likely that with a reduced golf course under Alternative 3, some golfers would choose to play golf at other regulation courses, which would increase the use of other 18-hole regulation golf courses in the surrounding area. Although the use of other regulation golf courses in the area may increase in the long term, some golfers would continue to use Lake Tahoe Golf Course and some would use golf courses outside of the area. Surveys indicated that approximately two-thirds of the golfers at the Lake Tahoe Golf Course are visitors from outside the area, so it is expected that many of these golfers would use other golf courses closer to home. Therefore, the increase in use of other golf courses in the long term would be dispersed, and there would not be a substantial increase in use at any one golf course that would cause physical deterioration of any facility. All other outdoor recreation opportunities would continue in the study area after construction. There would not be an increase in demand or use of recreational facilities for other types of outdoor recreation.

Currently no PAOTs are assigned to the golf course or the snowmobile course. It is expected that approval of the project would include assigning winter and summer day use PAOTs to the study area. Because the reduced golf course would result in less golfing opportunities, it would not need the same number of summer day use PAOTs as necessary under Alternatives 1 and 2. It would be expected that winter day use PAOT needs associated with Alternative 3 would be the same as under Alternative 1 and 2 because snowmobiling use on the golf course driving range would not change under this alternative. Because Alternative 3 would qualify under the EIP for PAOT assignment available from the existing reserve pool, it would not have an adverse effect on PAOT capacity for the study area or Tahoe Basin.

Short-term increases in demand would be temporary, and Alternative 3 would not result in a substantial increase in long-term use or demand for recreation opportunities that would result in physical deterioration of any facilities. In addition, Alternative 3 would not affect PAOT capacity. Therefore, this impact would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization/Existing 18-Hole Regulation Golf Course

IMPACT 3.8-1 (Alt. 4)	Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf. *Under Alternative 4, the existing golf course would remain largely unchanged. Therefore, little to no change in golf opportunities would occur. This impact would be* ***less than significant****.*

Alternative 4 would require a shorter construction period (i.e., 2–3 years) than the other action alternatives. Most of the work would be within the existing channel, and construction phasing would be the same for both years, working from upstream to downstream or downstream to upstream. Project-related activities would involve primarily in-channel work with minor floodplain work and restroom installation. Attempts would be made to keep nine holes of the golf course open during the 2- to 3-year construction period; however, it is possible that the golf course would need to be completely shut down for 1 year for construction access. Although golfing opportunities could be reduced during construction, this reduction in golfing opportunities would be temporary and other golf courses in the surrounding area would be open during construction.

Under Alternative 4, the current golf course would remain primarily in its existing configuration and location, with minor modifications to holes 6 and 7 to account for the removal two golf course bridges. One new bridge would be installed over the Upper Truckee River to accommodate two-way golf cart traffic. Minor modifications to the cart path would occur, and bridges across Angora Creek would remain. Three of the existing bridges over the Upper Truckee River would remain in place while the two upstream bridges would be replaced by one longer bridge. A new 650 square foot restroom facility would be constructed adjacent to hole 5. There would be only minor changes to the existing golf course under this alternative, the regulation 18-hole golf course would maintain its level of challenge and playability, and the existing hole lengths, slopes, and ratings would not change, and it would still be able to host championship play and tournaments.

Because construction-related effects would be temporary and the existing 18-hole regulation golf course would remain largely unchanged, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-2 (Alt. 4) **Reduction in Recreation Opportunities, Uses, and Experiences Related to Spring/Summer/Fall Dispersed Outdoor Recreation.** *Alternative 4 would not include substantial changes to spring, summer, and fall dispersed outdoor recreation opportunities in the study area. This impact would be* ***less than significant****.*

Under Alternative 4, construction activities would occur over a 2- to 3-year period. Most of the work would be within the existing channel and no construction would occur on the west side of the river (other than along the river) under this alternative. Therefore, the majority of casual or volunteer trails in the study area would not be affected by construction activities. Volunteer trails immediately adjacent to the river and use of the STPUD access road would be temporarily affected by construction activities.

Water-related recreation would be affected by construction within the river channel. Access to the river would not be allowed in areas of construction activity.

Although some trails and water-recreation opportunities in the study area would be reduced during construction, these effects would be temporary and other spring, summer, and fall outdoor recreation opportunities would be available in the surrounding area during the construction period.

Under Alternative 4, no long-term changes would be made to the network of existing volunteer trails in the study area, and water-related recreation, including fishing access, would continue on an informal basis along the Upper Truckee River. The existing trails and roads would remain in their current locations and are expected to have similar uses as existing conditions. Under this alternative, no new designated trails would be constructed on the east side of the river, and no tie-in would be made with the Sawmill Road Bike Path. The golf course bridges over the Upper Truckee River would remain closed to non-golf use.

Because short-term effects on spring, summer, and fall outdoor recreation would be temporary and no long-term changes to outdoor recreation in the study area would occur, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-3 (Alt. 4) **Reduction in Recreation Opportunities, Uses, and Experiences Related to Winter Recreation.** *Existing snowmobile recreation would be unavailable within the study area in the short term because the snowmobile track area would be used for construction staging. No other short-term or long-term changes would affect existing outdoor winter recreation opportunities, use, or experiences such as cross-country skiing, snowmobiling, and snowshoeing. This impact would be* ***less than significant****.*

This impact is the same as Impact 3.8-3 (Alt. 2) because short-term effects of Alternative 4 would be limited to closure of the snowmobile track within the driving range. However, snowmobiles would be available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling during the construction period and operations on the driving range would resume following construction. As under Alternative 2, no other short-term or long-term effects on outdoor winter recreation would occur. Snowmobiling within other parts of Lake Valley SRA and Washoe Meadows SP would continue to be prohibited. This impact would be less than significant.

No mitigation is required.

IMPACT 3.8-4 (Alt. 4) **Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Vicinity of the Study Area.** *Under Alternative 4, the existing golf course would remain largely unchanged and would offer golfing opportunities similar to those available under existing conditions. All other outdoor recreation opportunities would remain available in the study area. Therefore, this alternative would not increase the demand for recreational facilities or use of any other recreational facilities that would cause physical deterioration, or effects on PAOT capacity. This impact would be* ***less than significant****.*

This impact is the same as Impact 3.8-4 (Alt. 2) because increases in demand for other recreation areas in the vicinity of the study area would be temporary and there would be no long-term changes to recreation opportunities or demand for recreational facilities. Summer and winter day use PAOTs requirements would be the same as what are required under Alternatives 1 and 2. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.8-1 (Alt. 5) **Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf.** *Alternative 5 would involve decommissioning the entire 18-hole Lake Tahoe Golf Course and restoring the area to meadow habitat. Decommissioning the golf course would eliminate golfing opportunities in the study area. This impact would be* ***significant****.*

Under Alternative 5, construction would be phased over the 3- to 4-year period as described under Alternative 2. Upon completion, Alternative 5 would result in the removal of the golf course and restoration of the land in Lake Valley SRA as meadow and riparian habitat. State Parks would have the opportunity to conduct a follow-up planning process to determine the ultimate disposition of uses in both the Washoe Meadows SP and Lake Valley SRA units. If new park and recreation uses are proposed as a result of the planning effort, they would be subject to their own environmental review prior to approval.

If economically feasible, a temporary 9-hole golf course may remain in use for an interim period while State Parks evaluates alternative uses of this meadow area in the follow-up planning process. If this interim use approach is pursued, golf play would be limited in the first year of construction to a 9-hole course on the east side of the river to allow for construction access adjacent to the river during all years of construction. A temporary 9-hole course would use a portion of the existing 18-hole course. The layout of tees, fairways, and greens would be similar to the layout of holes at the 18-hole regulation course, but the course would include only nine holes, and the smaller course would fit on the southeast side of the river. All holes, cart paths, and bridges adjacent to the Upper Truckee River would be removed and only nine holes would remain. The 9-hole course would continue to operate from April 15 to November 1 from dawn until dusk. It would no longer host golf tournaments or championship play. Use of the clubhouse would be evaluated in a separate planning process.

If a temporary 9-hole golf course is not retained this alternative would permanently eliminate golfing opportunities in the study area upon construction implementation. As discussed for Alternative 2, one 18-hole executive golf course, one 18-hole regulation golf course, and the 9-hole Bijou Golf Course would be open for play within a 15-mile radius of the study area during the construction period. Within a 60-minute drive of the South Lake Tahoe area, eight other competitive golf courses offer an experience similar to the experience of the Lake Tahoe Golf Course in terms of aesthetic appeal (HEC 2008:32–33 [Appendix E]). However, decommissioning the Lake Tahoe Golf Course would permanently eliminate golfing opportunities in the study area, which would substantially reduce long-term, golfing opportunities in the South Lake Tahoe area. Therefore, this impact would be significant.

As discussed for Alternative 3, the comprehensive evaluation of potentially feasible alternative locations for the golf course determined that no feasible alternative location is available. Therefore, no feasible mitigation is available to reduce Impact 3.8-1 (Alt. 5) and this impact would remain significant and unavoidable.

IMPACT 3.8-2 (Alt. 5) **Reduction in Recreation Opportunities, Uses, and Experiences Related to Spring/Summer/Fall Dispersed Outdoor Recreation.** *Alternative 5 would result in the short-term loss of spring, summer, and fall dispersed outdoor recreation opportunities in the study area during construction. In addition, minor long-term changes would be made to the existing informal trail system adjacent to the river. All golf course bridges would be removed. However, they have not provided authorized non-golf use. This impact would be* ***less than significant****.*

Short-term effects on spring, summer, and fall outdoor recreation opportunities would be similar to effects described in Impact 3.8-2 (Alt. 2) because construction phasing would be similar for both alternatives. However, Alternative 5 would not include construction on the west side of the river outside of the historic meander belt. Short-term effects on volunteer trails and service roads within Washoe Meadows SP would be less than under Alternative 2; only trails adjacent to the Upper Truckee River and the use of the STPUD access road would be affected. Furthermore, removing bridges, completing in-channel work, and connecting historic meanders and new channel sections under Alternative 5 would interfere with water-related recreation on the Upper Truckee River such as fishing, swimming, and kayaking.

Under Alternative 5, the design approach for the Upper Truckee River would be the same as under Alternatives 2 and 3 except that the cart path bridges over the unnamed creek would be removed under Alternative 5. All five golf course bridges would be removed from the Upper Truckee River. In addition, the confluence of Angora Creek would be reconfigured and four cart path bridges would be removed. Approximately 0.75 mile of trail would be removed and no new trails are proposed under Alternative 5.

The existing golf course bridges that would be removed under Alternative 5 are used for unauthorized access between Washoe Meadows SP and Lake Valley SRA. This unauthorized access across the river would be eliminated under this alternative; however, because the access is not authorized and is actively discouraged by State Parks (as a result of safety concerns for non-golf users on a golf course), the removal of the bridges would not cause a significant loss of authorized, public recreational access. Public access to Washoe Meadows SP would remain at the end of several streets. Also, access across the river is provided by the Sawmill multi-use trail adjacent to U.S. 50.

In addition, the river would be restored and water-related recreation (e.g., swimming, kayaking, fishing) along the Upper Truckee River would continue informally in the study area after construction. Furthermore, by removing the golf course in areas adjacent to the Upper Truckee River fishing access would be improved by Alternative 5.

Short-term effects on spring, summer, and fall outdoor recreation would be temporary and available elsewhere and no long-term effects on authorized outdoor recreation opportunities would occur; therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-3 (Alt. 5) **Reduction in Recreation Opportunities, Uses, and Experiences Related to Winter Recreation.** *Alternative 5 would involve short-term loss of existing winter outdoor recreation opportunities within the golf course area. In addition, snowmobiling would be discontinued in the long-term. Other winter outdoor recreation would continue on an informal basis in the long-term within the study area. Therefore, this impact would be* ***less than significant****.*

In the short-term, the golf course portion of the study area would be closed for construction and staging, and winter recreation opportunities within this portion of the study area would not be available. However, cross-country skiing and snowshoeing would continue to be available in the short-term within Washoe Meadows SP. In addition, snowmobiling would be available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling.

In the long-term, snowmobiling would be discontinued because the snowmobile track on the driving range would be decommissioned along with the golf course. Other winter recreation activities (i.e., snowshoeing, cross-country skiing) would continue informally in the long-term in the study area. Although snowmobiling in the study area would be eliminated under this alterative, snowmobiling is available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling. Overall, the existing dispersed outdoor recreation opportunities, use, and experiences would not be substantially altered.

Because short-term effects on winter outdoor recreation would be temporary and available elsewhere, and outdoor winter recreation opportunities would continue to be available in the long term, this impact would be less than significant.

No mitigation is required.

IMPACT 3.8-4 (Alt. 5)	**Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Vicinity of the Study Area.** *Alternative 5 would result in the short-term loss of recreation opportunities in the study area during construction. After construction, the existing golf course would be decommissioned, which would eliminate golfing opportunities in the study area. In addition, snowmobiling in the study area would be eliminated. This change would increase the use of other golf courses and winter outdoor recreation facilities in the area; however, this increase would be dispersed among other facilities and would not lead to physical deterioration of any facilities. In addition, because no PAOTs have been assigned to the study area, there would be no affect on PAOT capacity. This impact would be* **less than significant***.*

Alternative 5 would result in reduced opportunities for golfing, spring/summer/fall outdoor recreation, and winter outdoor recreation in the short term. Therefore, demand for these activities could increase during the construction period. This increase would be temporary and would likely be dispersed among other recreational facilities in the surrounding area, and therefore would not cause an increase in physical deterioration to any one facility. The effects of short-term increases in demand for and use of recreational facilities would be less than significant. It is expected that removing the existing golf course under Alternative 5 would increase the long-term use of other golf courses in the surrounding area. Approximately two-thirds of the golfers at the Lake Tahoe Golf Course are visitors from outside the area, so it is expected that many of these golfers would use other golf courses closer to home. Local golfers would likely use multiple other golf courses in the South Lake Tahoe area. Therefore, the increased use of any one golf course would be dispersed among other available golf courses, and this alternative would not cause a substantial long-term increase in use of any individual golf course that would lead to physical deterioration.

In addition, Alternative 5 would eliminate snowmobiling in the study area. Snowmobiling within areas outside of the driving range within the SRA and within Washoe Meadows State Park would continue to be prohibited. Snowmobiling is available at other facilities in the surrounding area, and other outdoor winter recreation opportunities would remain available in the study area and the surrounding area. Therefore, outdoor winter recreation would be dispersed among other available facilities and would not cause a substantial increase in long-term use of any individual facility that would lead to physical deterioration.

No PAOTs have been assigned to the golf course or other recreational facilities within the study area. Therefore, although eliminating the golf course and snowmobile track would result in reduced recreation opportunities within the study area, there would not be a loss of PAOTs or a reduction in PAOT capacity. PAOTs necessary for and future planned recreational uses would be evaluated in a separate planning process for both Washoe Meadows SP and Lake Valley SRA.

Because short-term increases in demand would be temporary, Alternative 5 would not result in a substantial increase in use of or demand for recreation opportunities that would result in deterioration of other recreational facilities, and there would be no reduction in PAOT capacity, this impact would be less than significant.

No mitigation is required.

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3.9 CULTURAL RESOURCES

This section includes an evaluation of the potential impacts on cultural resources that could result from project implementation. Cultural resources may include archaeological traces, such as early Native American occupation sites and artifacts; historic-era buildings and structures; and places used for traditional Native American observances or places with special cultural significance. These materials can be found at many locations on the landscape in the Tahoe Basin. Along with prehistoric and historic human remains and associated grave-goods, such materials are protected under Federal and State statutes, including Section 106 of the National Historic Preservation Act (NHPA), and TRPA ordinances. Cumulative cultural resource impacts are discussed in Section 3.16, "Cumulative Impacts."

3.9.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

The criteria for determining the significance of cultural resources in the study area are based on NEPA Policies 1 and 2; Section 106 and its implementing regulations, and significance criteria for cultural resources listed in Title 36, Section 60.4 of the Code of Federal Regulations (36 CFR 60.4); Chapter 29, "Historic Resource Protection," of the TRPA Code of Ordinances; and CEQA and the State CEQA Guidelines. The following discussion focuses on cultural resources requirements applicable to the project.

Federal

NEPA Guidelines

In accordance with NEPA, an agency must consider:

- unique characteristics of the geographic area, such as proximity to historic or cultural resources (40 CFR 1508); and
- the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) (40 CFR 1508.27[b][8]).

Section 106 of the National Historic Preservation Act

Under Section 106 (Title 16, Section 470 and subsequent sections of the United States Code [16 USC 470 et seq.]) and its implementing regulations (36 CFR 800 et seq.), scoping, assessment, and consultation must occur to determine impacts on properties included in or eligible for the NRHP. Section 106 consultation is conducted during EIS preparation to determine whether historic resources will be adversely affected, and if so, whether measures can be implemented to reduce adverse effects to a less-than-significant level. Section 106 does not deal with impacts on all types of cultural resources, or all cultural aspects of the environment; it deals only with impacts on properties included in or eligible for the NRHP.

Section 106 requires Federal agencies to consider the effects of their actions—including those they fund or permit—on properties that may be eligible for listing or are listed in the NRHP. To determine an undertaking's effects on NRHP-eligible properties, archaeological, historical, and architectural properties must first be inventoried and their eligibility for listing in the NRHP must be evaluated. The lead Federal agency is responsible for complying with Section 106, but a qualified representative of the lead agency can conduct the necessary steps. Section 106 review involves four steps:

- Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties.

- Identify historic properties by determining the scope of efforts, identifying cultural resources, and evaluating their eligibility for inclusion in the NRHP.
- Assess adverse effects by applying the criteria of adverse effect on historic properties (resources that are eligible for inclusion in the NRHP).
- Resolve adverse effects by consulting with the State Historic Preservation Officer and other consulting agencies, including the Advisory Council on Historic Preservation if necessary, to develop an agreement that addresses the treatment of historic properties.

State

CEQA and Historical or Archaeological Resources

CEQA offers directives regarding project-related impacts on historical resources and unique archaeological resources. Generally, if implementing a project would result in significant environmental impacts, then public agencies must consider whether such impacts can be substantially lessened or avoided through feasible mitigation measures or feasible alternatives.

Only significant cultural resources (e.g., “historical resources” and “unique archaeological resources”) need to be addressed. The State CEQA Guidelines define a historical resource as, among other things, “a resource listed or eligible for listing on the California Register of Historical Resources” (CRHR) (State CEQA Guidelines, Section 15064.5[a][1]; see also Sections 5024.1 and 21084.1 of the California Public Resources Code. A historical resource may be eligible for inclusion in the CRHR, as determined by the State Historical Resources Commission or the lead agency, if the resource:

- is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- is associated with the lives of persons important in our past;
- embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- has yielded, or may be likely to yield, information important in prehistory or history.

In addition, a resource is presumed to constitute an “historical resource” if it is included in a “local register of historical resources” unless “the preponderance of evidence demonstrates that it is not historically or culturally significant” (State CEQA Guidelines, Section 15064.5[a][2]). CEQA (Public Resources Code, Section 21083.2) and the State CEQA Guidelines (Section 15064.5) also require consideration of unique archaeological sites. CEQA defines a unique archaeological resource as follows:

> …an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
>
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological site does not meet the criteria for inclusion in the CRHR, but does meet the definition of a unique archaeological resource, it is entitled to special protection or attention under CEQA. Treatment options under CEQA (Public Resources Code, Section 21083.2) include activities that preserve the resource in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria defining a unique archaeological resource).

Section 15064.5(e) of the State CEQA Guidelines requires that excavation cease whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. The lead agency must then consult with the appropriate Native Americans, as identified by the Native American Heritage Commission; under certain circumstances, the lead agency must develop an agreement with the Native Americans for the treatment and disposition of the remains (State CEQA Guidelines, Section 15064.5[d]).

Cultural Resources on State-owned Lands – PRC Section 5024.5

Historical and archaeological resources on state-owned lands are subject to the requirements of Section 5024.5 of the Public Resources Code (PRC). The provisions are intended to protect significant historical and prehistorical features by requiring notification of the State Historic Preservation Officer (SHPO) during the planning process. If the SHPO determines that a proposed action would have an adverse effect on a listed historical resource, the State Parks and SHPO shall adopt prudent and feasible measures that will eliminate or mitigate the adverse effects. State Parks would maintain written documentation of the SHPO’s concurrence with proposed actions which would have an effect on an historical resource on the master list.

Tahoe Regional Planning Agency

TRPA regulates growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (Regional Plan). TRPA’s Regional Plan, adopted in 1987, consists of several documents: the Goals and Policies, Code of Ordinances, Water Quality Management Plan, Plan Area Statements, and Scenic Quality Improvement Plan.

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The Goals and Policies document of the 1987 Regional Plan establishes an overall framework for development and environmental conservation in the Lake Tahoe region. The Conservation Element (Chapter IV) of the Goals and Policies document considers 10 subelements selected to cover the full range of Lake Tahoe’s natural and historical resources. The following goal and policies in the Cultural subelement are applicable to this project:

GOAL 1: Identify and preserve sites of historical, cultural, and architectural significance within the region.

- **Policy 1:** Historical or culturally significant landmarks in the Basin shall be identified and protected from indiscriminate damage or alteration.

- **Policy 2:** Sites and structures designated as historically, culturally, or archaeologically significant shall be given special incentives and exemptions to promote the preservation and restoration of such structures and sites.

Code of Ordinances

In compliance with Federal and State laws, TRPA has adopted guidelines to determine the significance of cultural resources in the Tahoe Basin and impacts on such resources. Section 29.5 in Chapter 29 of the TRPA Code of Ordinances states that "sites, objects, structures, districts or other resources of historical, cultural, archaeological, paleontological, or architectural significance locally, regionally, state-wide, or nationally" must meet at least one of the following criteria:

- resources associated with historically significant events such as an important community function or memorable happening in the past, or that contain qualities reminiscent of an early stage of development in the region;

- resources associated with significant persons, such as buildings or structures associated with a locally, regionally, or nationally known person; notable examples or best surviving works of a pioneer architect; or structures associated with the life or work of significant persons;

- resources embodying the distinctive characteristics of a type, period, or method of construction; possessing high artistic values; or representing a significant or distinguishable entity;

- archaeological or paleontological resources protected or eligible for protection under Federal or State regulations; or

- prehistoric archaeological or paleontological resources that contribute to the knowledge and understanding of early cultural or biological development.

Section 29.2 of the TRPA Code of Ordinances requires the protection of sites, objects, structures, or other resources designated as historic resources, or for which designation is pending. Demolition, disturbance, removal, or significant alterations are prohibited unless TRPA has approved a resource protection plan to protect the historic resources. Section 29.2.A requires that the resource protection plan be prepared by a qualified professional cultural resources specialist and provide for resource documentation and evaluation. Section 29.2.B requires protection during construction, which includes prohibiting grading or excavation in designated historic resource areas, except with a TRPA-approved resource protection plan (TRPA 1991).

Section 64.8 of the TRPA Code of Ordinances addresses the discovery of historic resources during grading activities. Grading must cease and TRPA must be notified if resources are encountered that appear to be 50 years or older. TRPA will suspend grading and consult with appropriate Federal, State, or local entities to determine the significance of the resource, if any. The property owner must protect the materials during the investigation period (TRPA 1991).

ENVIRONMENTAL SETTING

This section of the draft EIR/EIS/EIS describes the cultural resources that may be affected as a result of implementation of any of the project alternatives.

Cultural Setting

Prehistoric Archaeological Context

Heizer and Elsasser (1953) were the first researchers to postulate an archaeological chronology for the north-central Sierra Nevada. Based on mutually exclusive site locations and tool technologies noted from the Tahoe Basin, they identified two main cultural manifestations or "complexes":

- **The Martis Complex (ca. 5000–1300 years Before Present [B.P.])**. This period, also commonly referred to as the "Middle Archaic," was defined by a heavy reliance on flaked basalt implements and milling stones and slabs for the grinding of seed foods. The predominance of flaked and ground stone artifacts on archaeological sites of this time appears to reflect an economic focus on hunting and seed gathering. This complex was first identified at site CA-Pla-5 in the Martis Valley, south of Truckee.

- **The Kings Beach Complex (ca. 1300–150 B.P.)**. In contrast with the Martis Complex, technology during this time was characterized by chert and obsidian toolstone, bedrock mortars, smaller projectile points (presumably arrow points), and an economic emphasis on fishing and seed gathering. The Kings Beach Complex is usually attributed to the late prehistoric Washoe. Archaeological site CA-Pla-9 on the north shore of Lake Tahoe is the type site for the Kings Beach Complex.

Heizer and Elsasser's 1953 archaeological sequence for the north-central Sierra was revised and expanded to reflect research findings by Elston (1970, 1972), Elston and Davis (1972), and Elston, Davis, and Townsend (1976). Based on the subsequent discoveries of stratified archaeological deposits and on the presence of Great Basin Stemmed series projectile points and accompanying radiocarbon dates, the regional chronological framework was amended to include a pre-Martis culture, incorporating a transitional phase between Martis and Kings Beach (Elston, Davis, and Townsend 1976:44–51). Elston's "Pre-Archaic" (pre-Martis) incorporates the ill-defined **Tahoe Reach Phase** and broadly places the earliest Eastern Front prehistory between 10,000 and 8000 years B.P. This phase is generally associated with small, highly mobile groups whose economy was focused on game hunting. Little evidence for sites of this phase has been found in the Sierra Nevada; the presence of the Tahoe Reach Phase in the region is postulated based on sites of this age at lower elevations.

Cultural manifestations better defined by Elston (1970, 1972), Elston and Davis (1972), and Elston, Davis, and Townsend (1976) are listed below.

- **The Early Archaic (8,000–5,000 B.P.)**, which consists of the Spooner Phase, is described by Elston, Davis, and Townsend (1976:13) as "a hypothetical construct to name the interval for which little archaeological data existed, and it remains poorly known to the present." This cultural phase has been characterized (but not without some controversy; see Milliken and Hildebrandt 1997:22–23) by the presence of Pinto (Gatecliff) Split Stem and Humboldt series projectile points found predominantly in the Great Basin. Paleoenvironmental conditions during this period reflect a widespread Middle Holocene warming and drying trend. General cultural patterns attributed to the Early Archaic include small game hunting, increased milling of hard seeds, and mixed-mode, forager-collector subsistence strategy.

- **The Middle Archaic (5000–1300 B.P.)**, as defined by Elston, Davis, and Townsend (1976), is represented by the Early Martis (5000–3000 B.P.) and the Late Martis (3000–1300 B.P.) phases. During this time, conditions became cooler and wetter, similar to the climate experienced today. Human populations increased and diversified, although they remained low enough to prevent overexploitation of resources (Zeier and Elston 1992:8). The origins and cultural implications of the Martis Complex remain a mystery to local researchers and debate continues (e.g., Bloomer et al. 1997, Clewlow 1984, Duke 1998, Elsasser and Gortner 1991, Jackson et al. 1994:101–109). Researchers are discussing whether the Martis Complex represents a distinct cultural phenomenon or a unique culture specializing in high Sierran resources, particularly the uncharacteristic reliance on basalt toolstone. Lindström (1985), for instance, speculates that Martis reflects an indigenous Sierran culture, rather than comprising groups from the Great Basin or California that incorporate the mountains into their seasonal settlement patterns.

- **The Late Archaic** is divided into the **Early Kings Beach Phase (1300–700 B.P.)** and **Late Kings Beach Phase (700–150 B.P.)** (Elston, Ataman, and Dugas 1995). The transition from Middle to Late Archaic/ethnographic Washoe is described as one of "profound cultural change" (Elston 1986:19). Environmental conditions continued to be temperate during the Late Archaic, although periodic warm-dry intervals appear to have resulted in substantial and prolonged droughts (Lindström and Bloomer 1994:17). Socioeconomic and technological changes likely resulted from population increases and "demographic packing" and consequent "interspersed" settlement patterns (Elston 1986). Innovations attributed to the Late Archaic include the bow and arrow as well as the increased use of bedrock mortars (for exploitation of the piñon pine) and simple flake tools. The use of basalt and other coarse-grained material to manufacture tools decreased during this time, while obsidian and chert were increasingly exploited.

In summary, the cultural chronology for the Sierra/Lake Tahoe region recognizes six generally distinct phases, each of which can be defined largely by the presence of distinct projectile points found on archaeological sites:

- Tahoe Reach Phase (ca. 10,000–8000 B.P.)—Great Basin Stemmed series projectile points.
- Spooner Phase (ca. 8000–5000 B.P.)—various large basalt projectile points.
- Early Martis Period (ca. 5000–3000 B.P.)—Martis Contracting Stem and Martis Split Stem projectile points.
- Late Martis (ca. 3000–1300 B.P.)—Martis Corner Notched, Elko Corner Notched, and Elko Eared points.
- Late Archaic—divided into the Early Kings Beach Phase (ca. 1300–800 B.P.), typified by Rosegate and Gunther Series points and the Late Kings Beach Phase (ca. 800–150 B.P.), marked by Desert Side–notched and Cottonwood series projectile points.

Ethnographic Context

Lake Valley SRA and Washoe Meadows SP are situated within the ethnographic territory of the Washoe, who inhabited the Tahoe Basin region at the time of Euro-American contact in the early 1840s (Carlson 1986; d'Azevedo 1986:466–471; Price 1962, 1980). The largest Washoe settlements were found in the larger valleys on and along the eastern slope of the Sierra Nevada between Honey Lake to the north and Little Antelope Valley to the south (d'Azevedo 1986:468 [Figure 1], Elston 1986:13).

Although most Washoe resided in long-term or "winter" settlements in the lowland valleys east of the Sierra crest, Lake Tahoe was the spiritual and geographic center of the Washoe world (Downs 1966:16). The Washoe, members of the widespread Hokan linguistic group, are the only Great Basin group to speak a non-Numic language. Although the evidence is far from conclusive, Kroeber (1925:569) and Downs (1966:70) postulate an early relationship (more than 4,500 years ago) between the Hokan-speaking Washoe and other Hokan speakers in California.

The Washoe were economically and socially organized into basic household or extended family units residing in multifamily communities (Barrett 1917:8, Jackson et al. 1994:II.A). Groups maintained ties with each other and with neighboring Penutian-speaking groups, including the Maidu, Miwok, and Paiute. The territory of ethnographic Washoe, like the territories of most native California groups, was fluid; it was also utilized by non-Washoe neighboring groups, particularly when resources were abundant, or as a trade/travel corridor. Joint land use, particularly in areas where resources were abundant or that served as trade and travel corridors, was usually accommodated by negotiation (d'Azevedo 1986:467).

With a relatively abundant environment and some of the highest precontact population densities in the region (Lindström and Bloomer 1994:27, Price 1980), the Washoe pursued an "intensive subsistence strategy and a demographically packed settlement pattern" (Zeier and Elston 1986:379). This pattern of land use involved high seasonal mobility, mixed strategies of foraging and collecting, and intensive exploitation of resources. Areas such as the upper Truckee River watershed include several types of microenvironments—meadows, marshes, and riparian corridors—and each supported a diverse range of floral and faunal species available for use by the Washoe.

Fishing was one of the most important forms of subsistence acquisition available to the Washoe, and d'Azevedo (1986:473) and Lindström (1992:308) suggest that this activity provided the most predictable and consistent source of year-round food during prehistoric and ethnographic times. Seasonal fish runs occurred in all of the major rivers and streams along the eastern side of the Sierra Nevada. Runs in the streams surrounding Lake Tahoe included varieties of Tahoe sucker (*Catostomus tahoensis*) and Lahontan cutthroat trout (*Salmo clarki henshawi*) in the spring and summer, and mountain whitefish (*Prosopium williamsoni*) in the fall and winter. Fishing was accomplished through the use of spears, traps, weirs, hooks and lines, and angling through ice-holes during the winter months.

The hunting of large and small mammals provided hides, bone, ligament, and other important materials as well as another important food source. The late summer and early fall were preferred hunting seasons when species such as mule deer, pronghorn antelope, and mountain sheep were at their most robust. Hares and jackrabbits (white-tailed jackrabbit, cottontail, and snowshoe hare) also supplied an abundant meat source, and drives were organized in late fall to take advantage of this important resource.

The wide variety of flora available provided a substantial part of the diet of the Washoe, and many species were valued for their medicinal properties. The varied distribution of seasonally available plants was a major factor in the dispersal of Washoe groups and their frequent movements over a large range. Two of the most important Washoe staple foods, pine nuts (*ta gim*) and acorns (*malin*), were available mostly in the late fall and winter when other plant resources were becoming scarce. The study area is within lands traditionally used by the Carson Valley Washoe as a route to the western Sierra Nevada, where they obtained acorns. The eastern *Pauwalu* band of Carson Valley and southern *Hungalelti* band from Woodfords may have occupied the present-day Washoe Meadows SP seasonally, probably from spring through fall (d'Azevedo 1986:468–469).

In general, Washoe lifeways remained largely unchanged for centuries until the middle decades of the 19th century. Would-be miners, loggers, ranchers, and Euro-American settlers began to flood the region following the gold strikes in the Sierra Nevada foothills and the silver discoveries in the nearby Nevada Comstock Lode. Like many Native American groups in California and Nevada, the Washoe suffered greatly from the loss of their traditional territory and lifeways, and their population decreased dramatically and soon became marginalized. Today, however, the Washoe people constitute a thriving native community that is reinvesting in its heritage and culture through newfound political, economic, and social influence throughout the Basin and the surrounding region.

Historic-Era Context

Although the earliest documented Euro-American presence in the Lake Valley area occurred in the late 1840s and the early to mid-1850s as travelers and surveyors passed through the area, it was the Comstock mining boom in Nevada starting in 1859 that led to rapid development of the Tahoe Basin (Scott 1957:179–185). The surge in freight and passenger traffic through the Sierra Nevada quickly led to the creation of improved transportation routes, the harvesting of vast stands of timber, and the eventual development of ranching, all of which have played important roles in the economic and social history of the Lake Valley area.

Transportation

The most prominent historic-era transportation feature in the vicinity of the study area is present-day U.S. 50, which has largely followed the existing roadway alignment since at least the 1860s. Formerly known as the Johnson Pass Road, the Placerville–Lake Tahoe Road, the Lake Bigler Toll Road, and the Lincoln Highway, U.S. 50 was originally part of a series of routes informally referred to in the 19th century as the Bonanza Road System in reference to its connection with the rich Comstock Lode mines, located just over the Sierra crest in Nevada (Lindström 2004:8, Scott 1973:59). Originally laid out in 1852 as little more than a footpath, the Johnson Pass Road was not capable of supporting wagon traffic before 1854 (Hoover, Rensch, and Rensch 1966:76).

For much of the 19th century, roadways in the Tahoe Basin supported the region's mining, ranching, and timber industries. However, by the latter years of the 1800s, Lake Tahoe tourism began to emerge as a powerful economic force. Once the automobile became a common fixture on the American landscape, the Tahoe Basin's recreation industry boomed. To encourage tourism and to further entice Americans to purchase automobiles, the Lincoln Highway Association was established in 1912. The association was founded by Carl Fisher, owner of the Indianapolis Motor Speedway; Henry Joy, President of the Packard Motor Car Company; and Frank Seiberling of Goodyear. The goal of the association was mainly to create a demand for automobiles and related products and services (Lincoln Highway Association 2008).

Completed by 1915 in time for the Panama-Pacific Exposition in San Francisco, the Lincoln Highway consisted of a route patched together from preexisting roads and newly built "seedling miles" intended to spur growth. The route started in New York City's Times Square and ended in Oakland's Jack London Square. The Sierra Nevada Southern Route of the Lincoln Highway through Lake Valley was a somewhat later designation, only incorporated into the system in 1924. This route generally followed present-day U.S. 50, although it did deviate from that alignment and followed Pioneer Trail through a portion of South Lake Tahoe (Lincoln Highway Association 2008).

At the time the Lincoln Highway Association was established, the Federal government had nothing to do with the designation and construction of the route; the highway was a strictly private venture. However, with the passage of the Federal Highway Act of 1921, many sections of the 1915 Lincoln Highway were absorbed into the Federally administered interstate system and were assigned numerical designations. This was the eventual fate of the 1924 route through Lake Valley and South Lake Tahoe.

Lumbering

Logging in the Tahoe Basin generally began in support of the Nevada Comstock mines in 1859 and expanded to support the rapid economic and population growth in Carson City, Reno, and Northern California. By the early 1880s, timber production was the single most important regional industry, significantly outpacing the economic output of ranching and agriculture in the region (Scott 1957:186).

Several major lumber companies operated within the Tahoe Basin during the 19th and 20th centuries. Among them was the Carson & Tahoe Lumber and Fluming Company (CTLFC), which had some holdings within the study area. Founded in 1873, the CTLFC was one of the earliest and largest firms in the region and owned property in the east-central, south, and southwestern portions of the Tahoe Basin (Lindström 2004:11). By the 1890s, the company had obtained timber rights on more than 6,000 acres in the southern part of the basin. Business prospered; the CTLFC supported its own employees but also provided economic support for the ranchers, dairymen, and other entrepreneurs throughout the region. However, in keeping with the boom-and-bust cycles of the industry, the CTLFC and other companies began to scale back their operations as saleable timber diminished. Many of these companies soon ceased to exist altogether, and the industry eventually faded as the primary source of employment and income in the region.

Ranching and Dairy Farming

One of the first industries established in the Lake Valley area, aside from timber production, was ranching and dairy farming. The prominence of this endeavor is reflected in the 1870 California Products of Agriculture census, which shows production of 228 tons of hay and 500 tons of butter in Lake Valley alone (Scott 1957:186). By 1875 the quantity of butter produced in the valley had decreased, but at 42 cents per pound, dairy farming was still a profitable venture along with hay production (hay was selling for $30 per ton).

With the rise in timber production, dairy farming and ranching in Lake Valley decreased during the latter decades of the 19th century. However, even during this brief period of decline, it was noted in 1880 that some 1,800 head of cattle were grazing in the valley (Scott 1957:186). By the turn of the century, when most of the profitable stands of timber had been cut in the region, dairy farming expanded once again, revived in part by the increased pasturage made available by the lack of dense stands of timber.

Although portions of the study area were owned or otherwise controlled by the CTLFC (portions of Sections 20 and 21 on the present-day U.S. Geological Survey Echo Lake quadrangle map) during the early 20th century, most of the present-day Washoe Meadows SP and Lake Valley SRA was owned by “M. Forni et al.” and C. G. Celio & Sons. Samuel and Cesare Forni (cousins) arrived in the Lake Valley region in 1870 and were soon established as one of the largest cattle families in El Dorado County. The Celio family operated their dairy between 1870 and about 1931, at which time they began to rent the property to Walter Broder, who eventually—in 1942—purchased 600 acres of the land and dairy facilities. However, by 1950, Broder discontinued the dairy operations and was strictly raising beef cattle (Shapiro, Jackson, and Fernandez 2004:23).

Bordering the study area in the northwest portion of Section 21 was land owned by the Barton Ranch, one of the most prominent ranches in the area during the late 1800s and early 1900s (Lindström 2004:Figure 8). First established by Hiram Barton in the 1860s, the Barton Ranch, like many in the Tahoe Basin, was primarily a seasonal pursuit. According to Alva Barton, a direct descendent of Hiram Barton, the Lake Valley meadows were used primarily as summer range for livestock because of the cooler temperatures, well-watered meadows, and lush graze (Lindström and Rucks 2002:18). However, even some of these pastures needed to be irrigated at times and networks of impounding dams, wing walls, water gates, and various earthworks needed to be constructed. These networks for irrigation are still visible on the landscape through Lake Valley today.

Methodology and Findings of the Cultural Resources Study

Cultural resource investigations for the project consisted of a phased approach that included Native American consultation, prefield research, field reconnaissance surveys, and resource documentation. All aspects of the cultural resource study were conducted in accordance with the *Secretary of the Interior’s Guidelines for Identification of Cultural Resources* (48 CFR 44720–44723).

Native American Consultation

Implementing regulations for Section 106 require that Federal agencies identify potentially affected Indian tribes that might have knowledge of sites of religious and cultural significance in the area of potential effects (36 CFR 800.3[f][2]). If any such properties exist, Federal agencies must invite Indian tribes to participate in the Section 106 process as consulting parties. In accordance with Section 106 requirements, State Parks contacted the Washoe Tribe of Nevada and California regarding the proposed project (Appendix H). Lynda Shoshone and William Dancing Feather of the Washoe Tribe contacted State Parks archaeologist Denise Jaffke regarding the Phase II archaeological testing conducted at several sites within the study area (Jaffke 2007), stating that they were in agreement with State Parks’ findings. EDAW (now AECOM) and State Parks have also been coordinating with Mr. Darrel Cruz, Tribal Historic Preservation Officer (THPO) for the Washoe Tribe regarding the proposed project. Mr. Cruz has been involved in reviewing previous study findings, the results of EDAW’s (now AECOM) archival and field research, and mitigation measures designed to reduce potential impacts on cultural resources to less-than-significant levels.

Archival Research

To determine the locations of documented cultural resources within and in the vicinity of the study area, EDAW (now AECOM) conducted background research at the USFS' Lake Tahoe Basin Management Unit (LTBMU). The LTBMU maintains files on cultural resources throughout the Tahoe Basin, including those within the study area. These include State Parks Series 523 Primary, Archaeological Site, and other related forms, historical documents, and cultural resources reports. All relevant site documents, maps, and previous cultural studies at the LTBMU and additional materials were made available through State Parks.

Cultural Resources Documented in the Study area

A total of four prehistoric cultural resources have been documented within the study area that could be affected by the proposed alternatives (Table 3.9-1). These include sites showing evidence of early Native American occupation and retain integrity and data potential; rendering them eligible for NRHP listing under Criterion d. These sites consist of CA-Eld-2158, CA-Eld-2160, CA-Eld-555, and CA-Eld-2156. Sites CA-Eld-2158, CA –Eld-2156, and CA-Eld-2160 were recommended eligible to the NRHP based on subsurface evaluation investigations conducted by Jaffke (2006). Site CA-Eld-555 was recommended eligible by Shapiro, Jackson, and Fernandez in 2004 based on the presence of surface artifacts, a bedrock mortar, and indications of subsurface potential are assumed eligible for the purpose of this project (Jaffke 2009).

Table 3.9-1
Significant Cultural Resources within the Study Area

Site No.	Association	Resource Type	Location				NRHP/CRHR Eligibility Recommendations
			USGS Quadrangle	T.	R.	S.	
CA-ELD-555	Prehistoric–Historic	Lithic scatter, bedrock mortar, historic-era debris	Echo Lake	12N	18E	30	Prehistoric—eligible; Historic—not eligible
CA-ELD-2156	Prehistoric	Lithic Scatter	Echo Lake	12N	18E	19	Eligible
CA-ELD-2158	Prehistoric	Lithic scatter	Echo Lake	12N	18E	19	Eligible (Locus B)
CA-ELD-2160	Prehistoric	Lithic scatter	Echo Lake	12N	18E	20	Eligible

Notes:
CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places; R. = Range; S. = Section; T. = Township; USGS = U.S. Geological Survey
Sources: Data provided by DPR in 2007 and LTMBU in 2007; Shapiro, Jackson, and Fernandez 2004

3.9.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies.

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, an alternative would result in a significant impact on cultural resources if it would:

- cause a substantial adverse change in the significance of a unique archaeological resource or a historical resource as defined in Section 21083.2 of CEQA and Section 15064.5 of the State CEQA Guidelines, respectively;
- have the potential to cause a physical change that would affect unique ethnic cultural values;
- restrict existing religious or sacred uses within the potential impact area; or
- disturb any human remains, including those interred outside of formal cemeteries.

Section 15064.5 of the State CEQA Guidelines defines "substantial adverse change" as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resources is materially impaired.

NEPA Criteria

Under NEPA, the criteria for determining the significance of impacts to cultural resources is based on whether or not a particular resource is eligible for listing on the National Register of Historic Places (NRHP). These criteria also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. Under Section 106, an adverse effect on a historic resource ("historic property") (a resource presently listing or determined eligible for listing on the NRHP) is found when an undertaking may alter, directly or indirectly, any of the characteristics of the property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be further removed in distance, or be cumulative. Adverse effects on historic properties include but are not limited to:

- physical destruction of or damage to all or part of the property;
- alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties (36 CFR Part 68) and applicable guidelines;
- removal of the property from its historic location;
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on cultural resources if it would:

- result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object, or building;
- be located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records;
- occur on a property associated with any historically significant events and/or sites or persons;
- have the potential to cause a physical change that would affect unique ethnic cultural values; or
- restrict historic or prehistoric religious or sacred uses within the potential impact area.

METHODS AND ASSUMPTIONS

The following analysis is based on a combination of background research, archaeological pedestrian surveys, site investigations, and consultation with the Native American community. Research into potential cultural resources issues began with contacts made with the Washoe Tribe of Nevada and California by State Parks in 2006 for NRHP evaluation excavations proposed for archaeological sites CA-Eld-2152, CA-Eld-2157, CA-Eld-2158, and CA-Eld-2160. These sites were contained within portions of the project site and could have been affected by proposed river restoration activities and golf course reconfiguration. Further consultation with the Washoe Tribe occurred in 2007, also in relation to NRHP evaluation studies (CA-Eld-2156 and CA-Eld-2159).

EDAW (now AECOM) cultural resources specialists also contacted the Washoe Tribe directly in 2007 and coordination with State Parks is ongoing. Most importantly, the Tribal Historic Preservation Officer for the Washoe Tribe, Mr. Darrel Cruz, has been involved in the planning process and the mitigation of potential impacts on important early Native American cultural resources situated within and in the immediate vicinity of the project site.

EDAW (now AECOM) archaeologists, in coordination with State Parks and the USFS LTBMU, reviewed archaeological site records and other documents related to all presently documented cultural sites, features, and artifacts located in and near the study area. Although conventional records searches within California are typically conducted through the California Historical Resources Information System (CHRIS), in this case State Parks and LTBMU maintained more extensive and detailed archives for the project site and the overall study area than the CHRIS. Consequently, the CHRIS was not consulted for this effort. In addition, State Parks archaeologist Denise Jaffke has been in regular contact with the Washoe Tribe regarding cultural resources and culturally sensitive locales on and near the project site. This ongoing contact has provided information on ethnographic and recent historic-era Washoe Tribe use of the study area and the surrounding region.

Archaeological surface surveys and subsurface investigations have been conducted within the entire study area Among these investigations are reconnaissance-level surveys performed by EDAW (now AECOM) and State Parks and an intensive cultural resources inventory conducted by Pacific Legacy within the Washoe Meadows SP. Subsurface investigations included the NRHP evaluation reports on the sites noted above. Information derived from these investigations, archival research, and consultation with the Washoe Tribe has provided a highly detailed and up-to-date assessment of the nature and distribution of prehistoric and historic-era sites, features, and artifacts within and near the study area.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.9-1 (Alt. 1)	Damage to or Destruction of Significant Documented Cultural Resources*. Research has documented 10 prehistoric and historic-era cultural resources recommended eligible for listing on the NRHP/CRHR within and in the immediate vicinity of the study area. None of these sites are situated within areas that would be directly affected by Alternative 1. Consequently,* ***no impact*** *would occur.*

The NRHP/CRHR-eligible cultural resources situated in the study area range from Native American habitation sites, lithic artifact scatters, and bedrock mortars to historic-era building remains and refuse deposits. These include the locations of early Native American habitation such as sites CA-Eld-2160, CA-Eld-2158, and CA-Eld-555. Site CA-Eld-555 is of particular interest to the local Washoe Tribe because many tribal members remember a time when their parents and grandparents camped in this vicinity on a seasonal basis or when working in nearby sawmills. Euro-American occupation of the area can be found in several documented historic-era occurrences such as the Celio Barn (CA-Eld-2151H) or the remains of an early log house and associated debris scatters (CA-Eld-530H). These resources represent traces of human activity over a period of several thousand years within and in the vicinity of the project site. None of these locations, however, would be affected by Alternative 1 because none are situated within or immediately adjacent to the existing golf course. Also, Alternative 1 would not involve ground disturbance activities additional to what would otherwise be able to occur as a result of existing operating conditions (i.e., maintenance of the golf course or repair of existing streambank treatments and bridges). Consequently, no impact would occur.

No mitigation is required.

IMPACT 3.9-2 (Alt. 1)	Damage to or Destruction of As-Yet Undiscovered Cultural Resources. While *subsurface disturbances associated with golf course maintenance or repair of riverbank erosion and damage could potentially destroy or damage as-yet undiscovered prehistoric or historic-era cultural resources, this risk of disturbance is not different than existing conditions. If these resources were disturbed, they would be handled according to State Parks' existing cultural resource management procedures, which would provide adequate response, protection of discovered resources, and consultation with the Washoe Tribe, as needed. Because there is no adverse change in the risk of disturbing undiscovered resources, there would be* ***no impact*** *difference from existing conditions.*

Recent archaeological investigations in the study area (Jaffke 2006, Jaffke and Bloomer 2007) have demonstrated that subsurface archaeological deposits can and do occur in the region. Although the existence of such deposits is often indicated by the presence of surface artifacts, this may not always be the case in areas where ongoing golf course maintenance and use or river bank erosion might occur. Although surface scatters of prehistoric and historic-era artifacts are commonly encountered in the project vicinity and study area, they are often ephemeral and typically do not possess the integrity, association, or data potential necessary for listing on the NRHP or CRHR. Subsurface archaeological remains, on the other hand, are more likely to represent intact deposits capable of retaining, in particular, data potential. Such sites could, due to their potential ability to be used in addressing scientific research topics, be eligible for NRHP/CRHR listing and ongoing activities, such as golf course use and repair, could disturb previously unknown resources. . However, existing State Park's management procedures provide a mechanism for adequate protection of such sites and response to unintentional discoveries resulting in no further impacts.

No mitigation is required

IMPACT 3.9-3 (Alt. 1)

Discovery of Human Remains. *While subsurface disturbances associated with golf course maintenance or repair of riverbank erosion and damage could potentially uncover prehistoric or historic-era human remains, this risk of disturbance is not different than existing conditions. If human remains were discovered, they would be handled by State Parks according to existing State of California regulations which would provide adequate response, protection of human remains, and investigation and/or repatriation as appropriate. Because there is no adverse change in the risk of uncovering or disturbing human remains, there would be **no impact** difference from existing conditions.*

Although no human remains have been documented in the project site or study area, the presence of subsurface archaeological materials suggests that prehistoric remains in particular could exist in subsurface contexts where they could be impacted by activities and occurrences such as ongoing golf course use and maintenance and river bank erosion. While historic-era human interments could also be uncovered, it is more likely that early Native American burials possibly associated with deeply buried archaeological materials such as those noted at sites CA-Eld-2158 and CA-Eld-2160 could be found and disturbed. Although such discovery and disturbance could constitute a significant impact, State Park's protocols and State of California regulations provide adequate protection and discovery response protocols that would result in no further impacts to presently unrecorded prehistoric or historic-era human interments.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.9-1 (Alt. 2)

Damage to or Destruction of Significant Documented Cultural Resources. *Research has documented four prehistoric cultural resources recommended eligible for listing on the NRHP/CRHR within and in the immediate vicinity of Alternative 2. If these resources were to be damaged or destroyed, this impact would be **potentially significant**.*

Four prehistoric archaeological sites (CA-Eld-2156, CA-Eld-2158, CA-Eld-2160, and CA-Eld-555) are located within or in areas immediately adjacent to the proposed reconfigured 18-hole golf course and/or proposed meadow and floodplain restoration activities. Three of these sites have been recommended eligible to the NRHP under Criterion D (data potential). Sites CA-Eld-2156, CA-Eld-2158 and CA-Eld-2160 were investigated by State Parks (Jaffke 2006) and both were found to contain well-preserved spatially and temporally discrete archaeological deposits that could contribute significant information on early Native American activities in the Tahoe Basin. Site CA-Eld-555 was assumed eligible for the purpose of this project (Pacific Legacy 2004 and Jaffke 2009).

Based on the current conceptual layout of the golf course reconfiguration, elements of Alternative 2 could affect each of these NRHP-eligible sites, but most notably would affect CA-Eld-2160, which is located completely within the proposed reconfigured 18-hole golf course. Site CA-Eld-2158 is located partially within the proposed golf course and portions could be affected by project-related ground-disturbing activities or subsequent course operation and maintenance. Site CA-Eld-555 is located at the western edge of an area where no golf course features or construction are proposed. Sufficient land area exists to avoid Site CA-Eld-555 during the detailed design of the golf course. State Parks would refine the design so the golf course footprint would entirely avoid the resource site. CA-Eld-2156 would be indirectly affected by the project due to increased use of the existing road that travels through the site during construction activities. Each of these four sites is considered an historical resource under CEQA and Section 106 of the NHPA; therefore, if any of them were damaged or destroyed by project activities, this impact would be potentially significant.

Mitigation Measure 3.9-1 (Alt. 2): Avoid Impacts to Documented Significant Cultural Resources (CA-Eld-2156, CA-Eld-2158, CA-Eld-2160, and CA-Eld-555) through a Combination of Site Capping, Project Design Revision, and Archaeological/Washoe Tribe Monitoring.

State Parks will employ one or a combination of three mitigation techniques that can be used to protect sites CA-Eld-2156, CA-Eld-2158, CA-Eld-2160, and CA-Eld-555 as determined during development of more detailed design. To the extent feasible, State Parks will design the project to avoid disturbance of the identified resources. If avoidance is not feasible, State Parks will cap the site locations over which the golf course and/or other related facilities would be constructed. The site capping method has been employed in recent years and, assuming certain qualities of fill and capping methodology, has been endorsed by the Advisory Council on Historic Preservation. Using either technique protects the resource from damage. Based on the layout of Alternative 2, capping a large area encompassing the easternmost portion of CA-Eld-2158 ("Locus B," the NRHP-eligible portion of the site) and CA-Eld-2160 and CA-Eld-2156 may be the most effective approach. During the design development, State Parks will consult with the Washoe Tribe to confirm that design revisions and/or capping are acceptable approaches to protect the resources. CA-Eld-2156, which is bisected by an existing road and experiencing erosion would also be capped.

Mitigation Technique (a): Site Capping. Capping of these sites is consistent with preservation methods described in the archaeological literature. Mathewson and Gonzalez (1988); Mathewson, Gonzalez, and Eblen (1992:10–12); and Mathewson (1989) all concur that burial and capping of an archaeological site, when performed appropriately, preserves the deposit in place. Their reasons are described as follows:

- Burial of an archeological site, unlike excavation, maintains the archaeological resource in place.
- An archaeological site is continually changing and decaying with time; hence, the goal of preservation is not to prevent change but to reduce the natural process of decay by shielding a site from adverse human and natural effects.
- Capping a site with soils of comparable or greater pH value than the pH of the on-site deposit can slow down decay of the organic constituents of an archaeological deposit.
- Capping the sites will make them less permeable to infiltration of surface water and will thus reduce the frequency and severity of cycles of inundation and drying that expedite the decay of organic remains.

Given these conditions and measures, the best method of preservation is to cap the sites with an initial lift of material that has a pH value that is equal to or greater than that currently located at the site locations. This material will be placed on the site so as to avoid direct ground disturbance of surface layers and to avoid compaction of on-site soils and cultural strata.

The potential for compaction decreases with depth; therefore, it is critical that potential stress from compaction be minimized during the initial placement of sediments covering the site. To meet this objective, an initial 1-foot-thick lift of uncompacted soil equal to or higher in pH than soils on-site will be placed directly over the cultural site by mechanized equipment. Working from outside the cultural site, the initial lift will be placed over the cultural site with a Caterpillar D6 LGP (low-ground-pressure) dozer or equivalent low-ground-pressure equipment. Within the cultural site boundaries, this initial lift will be placed in such a manner that the dozer travels only on previously placed material and never directly on the original ground surface.

Mitigation Technique (b): Project Revised Design to Avoid the Resource. If necessary to account for continued access to CA-Eld-555 in its present condition, State Parks will revise the final design of the southernmost proposed portion of the golf course. The final layout would leave an area within which the site is located completely undeveloped and designated as an Environmentally Sensitive Area. The boundaries of this area will be clearly marked and/or restricted with construction cyclone fencing or other suitable materials. No ground-disturbing activities will be permitted within this Environmentally Sensitive Area, nor will it be used for equipment or materials staging, or transit for vehicles or persons while golf course construction is ongoing.

Mitigation Technique (c): Archaeological/Washoe Tribe Monitoring. While the project will be designed to avoid these four sites to the extent feasible and/or other adequate measures will be developed to protect them during project construction and future golf course operation and maintenance activities, data recovery would be necessary at these sites, if complete protection is not feasible. Construction, and if necessary, data recovery would be monitored by a qualified member of the Washoe Tribe. Washoe and archaeological monitors will evaluate subsequent project-related ground-disturbing activities within and in the immediate vicinity of these site locations. If data recovery is necessary, findings of effect and one or more historic property treatment plans will be prepared and approved by the State Historic Preservation Officer, the lead Federal agency, and the Washoe Tribe THPO. Following data recovery investigations, a data recovery report will be prepared in accordance with the Secretary of the Interior's guidelines and guidance provided by the California Office of Historic Preservation and the THPO.

Implementation of Mitigation Measure 3.9-1 (Alt. 2) would reduce effects on sites CA-Eld-555, CA-Eld-2156, and CA-Eld-2160 if portions of the project could be designed to avoid these sites and/or if NRHP-eligible portions of CA-Eld-2158 (Locus B) , CA-Eld-2156, and CA-Eld-2160 are capped in accordance with established precedent. Archaeological/Washoe monitoring of ground-disturbing activities will also be implemented, along with data recovery, if complete protection is not feasible. Implementation of Mitigation Measure 3.9-1 (Alt. 2) would reduce this impact to a less-than-significant level by protecting the sites from project-related disturbances and potential impacts from ongoing and future golf course use and maintenance. Previously un-recorded cultural materials potentially discovered during monitoring would be protected through their identification and subsequent protection or through further investigation that would recover important scientific data suitable for addressing regional prehistoric or historic-era research issues.

IMPACT 3.9-2 (Alt. 2)	Damage to or Destruction of as-yet Undiscovered Cultural Resources. *Subsurface disturbances could potentially destroy or damage of as-yet undiscovered prehistoric or historic-era cultural resources. If these were to represent significant cultural resources per CRHR, TRPA, and/or NRHP criteria, this impact would be **potentially significant**.*

Recent archaeological investigations in the study area (Jaffke 2006, Jaffke and Bloomer 2007) have demonstrated that subsurface archaeological deposits can and do occur in the region. Although the existence of such deposits is often indicated by the presence of surface artifacts, this may not always be the case in areas where construction related to this alternative might occur. Although surface scatters of prehistoric and historic-era artifacts are commonly encountered in the project vicinity and study area, they are often ephemeral and typically do not possess the integrity, association, or data potential necessary for listing on the NRHP or CRHR. If subsurface archaeological remains are present, on the other hand, they are more likely to represent intact deposits capable of retaining, in particular, data potential. Such sites could, due to their potential ability to be used in addressing scientific research topics, be eligible for NRHP/CRHR listing and impacts to them from construction activities, such as golf course modifications and river treatments, could be significant per Section 106 and CEQA criteria. This impact would be potentially significant.

Mitigation Measure 3.9-2 (Alt. 2): Stop Work and Implement Measures to Protect Cultural Resources Discovered during Ground-Disturbing Activities.

If unrecorded cultural resources are encountered during project-related ground-disturbing activities, a qualified cultural resources specialist will be contacted to assess the potential significance of the find.

If an inadvertent discovery of cultural materials (e.g., unusual amounts of shell, animal bone, glass, ceramics, structure/building remains) is made during project-related construction activities, such as repairs to the river or golf course, ground disturbances in the area of the find will be halted and a qualified professional archaeologist and the Washoe Tribe's THPO will be notified regarding the discovery. The archaeologist, in cooperation with the THPO, will determine whether the resource is potentially significant per CRHR, TRPA, and/or NRHP criteria and will develop appropriate mitigation to protect the integrity of the resource and ensure that no additional resources are affected. Mitigation could include but is not necessarily limited to preservation in place, archival research, subsurface testing, or contiguous block unit excavation and data recovery.

Implementation of Mitigation Measure 3.9-2 (Alt. 2) would reduce this impact to a less-than-significant level by identifying previously-undocumented cultural resources prior to their destruction and providing an opportunity for their preservation in-place or for further investigation and the recovery of potential important scientific data that could be used to address regional prehistoric and historic-era research issues.

IMPACT 3.9-3 (Alt. 2)	Discovery of Human Remains during Construction. *Although no evidence exists to suggest that buried human remains would be encountered during project construction, the potential nonetheless exists for buried human remains to be encountered. Construction activities could thus result in damage to or destruction of such remains. This impact would be* ***potentially significant****.*

Although no evidence of prehistoric or early historic interments was found on the project site in surface contexts, this does not preclude the existence of buried human remains. Furthermore, human remains are known to occur in the project vicinity. California law recognizes the need to protect historic era and Native American human burials, skeletal remains, and items associated with Native American interments from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in Sections 7050.5 and 7052 of the California Health and Safety Code and Section 5097 of the California Public Resources Code.

It is possible that previously unknown buried human remains could be unearthed and damaged or destroyed during excavation activities associated with Alternative 1, such as grading or excavation for ongoing repairs. Damage to or destruction of human remains during construction or other project-related activities would be considered significant. Because there is potential for such damage to occur, this impact would be potentially significant.

Mitigation Measure 3.9-3 (Alt. 2): Stop Work and Comply with Relevant State Laws if Human Remains are Uncovered during Construction.

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, potentially damaging excavation in the area of the burial will be halted and the El Dorado County Coroner and a professional archaeologist will be contacted to determine the nature and extent of the remains.

The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code, Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code, Section 7050[c]).

Following the coroner's findings, State Parks or its authorized representative, an archaeologist, and the NAHC-designated Most Likely Descendant (MLD) will determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in Section 5097.9 of the California Public Resources Code.

The landowner will ensure that the immediate vicinity (according to generally accepted cultural or archaeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD will have 48 hours to complete a site inspection and make recommendations after being granted access to the site. A range of possible treatments for the remains may be discussed, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendents, or other culturally appropriate treatment. Assembly Bill [AB] 2641 (Chapter 863, Statutes of 2006) suggests that the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. AB 2641 includes a list of site protection measures and states that the landowner will comply with one or more of the following requirements:

- record the site with the NAHC or the appropriate Information Center,
- utilize an open-space or conservation zoning designation or easement, and/or
- record a document with the county in which the property is located.

State Parks or its authorized representative will rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify a MLD or if the MLD fails to make a recommendation within 48 hours after being granted access to the site. State Parks or its authorized representative may also reinter the remains in a location not subject to further disturbance if it rejects the recommendation of the MLD, and mediation by the NAHC fails to provide measures acceptable to State Parks.

Implementation of Mitigation Measure 3.9-3 (Alt. 1) would reduce potential impact to human remains to a less-than-significant level by adhering to these procedures and other provisions of the California Health and Safety Code and AB 2641(e). Therefore, either preserving the human remains in-place or, assuming an agreement can be reached between the property owner and the MLD, or resulting in the repatriation and/or re-interment of the remains in accordance with the wishes of the MLD.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.9-1 (Alt. 3)	Damage to or Destruction of Significant Documented Cultural Resources. *Research has documented 8 prehistoric and historic-era cultural resources recommended eligible for listing on the NRHP/CRHR within and in the immediate vicinity of the project site. None of these sites are situated within areas that would be affected by Alternative 3. Therefore,* ***no impact*** *would occur.*

No historic resources recommended NRHP eligible under Criterion d by State Parks (Jaffke 2006), are located within the project site under Alternative 3. Therefore, as currently designed under this alternative, proposed meadow/floodplain restoration activities would not affect the integrity of any sites within the study area. **No impact** would occur.

No mitigation is required.

IMPACT 3.9-2 (Alt. 3)	Damage to or Destruction of as-yet Undiscovered Cultural Resources. *Subsurface disturbances could potentially destroy or damage as-yet undiscovered prehistoric or historic-era cultural resources. If these were to represent significant cultural resources per CRHR, TRPA, and/or NRHP criteria, this impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-2 (Alt. 3): Stop Work and Implement Measures to Protect Cultural Resources Discovered during Ground-Disturbing Activities.

This mitigation measure is identical to Mitigation Measure 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, implementation of Mitigation Measure 3.9-2 (Alt. 3) would reduce this impact to a less-than-significant level.

IMPACT 3.9-3 (Alt. 3) **Discovery of Human Remains during Construction.** *Although no evidence exists to suggest that buried human remains would be encountered during project construction, the potential, nonetheless, exists that for buried human remains to could be encountered. Construction activities could thus result in damage to or destruction of such remains. This impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-3 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-3 (Alt. 3): Stop Work and Comply with Relevant State Laws if Human Remains are Uncovered during Construction.

This mitigation measure is identical to Mitigation Measure 3.9-3 (Alt. 2). For the same reasons as described for Alternative 2, implementation of Mitigation Measure 3.9-3 (Alt. 3) would reduce this impact to a less-than-significant level.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.9-1 (Alt. 4) **Damage to or Destruction of Significant Documented Cultural Resources.** *Research has documented 8 prehistoric and historic-era cultural resources recommended eligible for listing on the NRHP/CRHR within and in the immediate vicinity of the project site. None of these sites are situated within areas that would be affected by Alternative 4. Consequently,* ***no impact*** *would occur.*

This impact is the same as Impact 3.9-1 (Alt. 2). For the same reasons as described for Alternative 1, no impact would occur.

No mitigation is required.

IMPACT 3.9-2 (Alt. 4) **Damage to or Destruction of as-yet Undiscovered Cultural Resources.** *Subsurface disturbances could potentially destroy or damage as-yet undiscovered prehistoric or historic-era cultural resources. If these were to represent significant cultural resources per CRHR, TRPA, and/or NRHP criteria, this impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-2 (Alt. 4): Stop Work and Implement Measures to Protect Cultural Resources Discovered during Ground-Disturbing Activities.

This mitigation measure is identical to Mitigation Measure 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, implementing Mitigation Measure 3.9-2 (Alt. 4) would reduce this impact to a less-than-significant level.

IMPACT 3.9-3 (Alt. 4) **Discovery of Human Remains during Construction.** *Although no evidence exists to suggest that buried human remains would be encountered during project construction, the potential nonetheless exists for buried human remains to be encountered. Construction activities could thus result in damage to or destruction of such remains. This impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-3 (Alt. 4): Stop Work and Comply with Relevant State Laws if Human Remains are Uncovered during Construction.

This mitigation measure is identical to Mitigation Measure 3.9-3 (Alt. 2). For the same reasons as described for Alternative 2, implementing Mitigation Measure 3.9-3 (Alt. 4) would reduce this impact to a less-than-significant level.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.9-1 (Alt. 5)	**Damage to or Destruction of Significant Documented Cultural Resources.** *Research has documented no prehistoric cultural resource recommended eligible for listing on the NRHP/CRHR within or in the immediate vicinity of Alternative 5. Therefore,* ***no impact*** *would occur.*

This impact is the same as Impact 3.9-1 (Alt. 3). For the same reasons as described for Alternative 3, no impact would occur.

No mitigation required.

IMPACT 3.9-2 (Alt. 5)	**Damage to or Destruction of as-yet Undiscovered Cultural Resources.** *Subsurface disturbances could potentially destroy or damage as-yet undiscovered prehistoric or historic-era cultural resources. If these were to represent significant cultural resources per CRHR, TRPA, and/or NRHP criteria, this impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-2 (Alt. 5): Stop Work and Implement Measures to Protect Cultural Resources Discovered during Ground-Disturbing Activities.

This mitigation measure is identical to Mitigation Measure 3.9-2 (Alt. 2). For the same reasons as described for Alternative 2, implementation of Mitigation Measure 3.9-2 (Alt. 5) would reduce this impact to a less-than-significant level.

IMPACT 3.9-3 (Alt. 5)	**Discovery of Human Remains during Construction.** *Although no evidence exists to suggest that buried human remains would be encountered during project construction, the potential nonetheless exists that buried human remains could be encountered. Construction activities could thus result in damage to or destruction of such remains. This impact would be* ***potentially significant****.*

This impact is the same as Impact 3.9-3 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.9-3 (Alt. 5): Stop Work and Comply with Relevant State Laws if Human Remains are Uncovered during Construction.

This mitigation measure is identical to Mitigation Measure 3.9-3 (Alt. 2). For the same reasons as described for Alternative 2, implementing Mitigation Measure 3.9-3 (Alt. 5) would reduce this impact to a less-than-significant level.

3.10 TRANSPORTATION, PARKING, AND CIRCULATION

This section describes regulations related to transportation, parking, and circulation, and the existing transportation systems in the project vicinity; identifies significance criteria for impacts on transportation, parking, and circulation; and evaluates potential impacts associated with the project alternatives. Consistency with TRPA goals and policies is presented in Section 3.2, "Land Use," Table 3.2-1. Cumulative transportation and parking impacts are presented in Section 3.16, "Cumulative Impacts." The project effects on thresholds are described in Chapter 4, Section 4.6 "Consequences for Environmental Threshold."

3.10.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Several State, regional, and local transportation-related standards and criteria apply to the project (Table 3.10-1), as described below. Standards and performance targets are identified in the Transportation Element of the *Regional Plan for the Lake Tahoe Basin* (*Regional Plan*), the TRPA threshold evaluation reports (TRPA 2002, 2007a), the *Regional Transportation Plan–Air Quality Plan for the Lake Tahoe Region* (RTP-AQP) (TRPA 1995), the *U.S. 50 Transportation Concept Report* (TCR), and the *El Dorado County General Plan* (El Dorado County 2004). Of these plans, the RTP-AQP provides the most detailed direction for transportation program development within the study area. Its provisions are discussed under "Tahoe Regional Planning Agency" below.

Table 3.10-1
Transportation and Circulation Standards

Plan/Policy	Standard/Criteria
Tahoe Regional Planning Compact (1980)	Transportation planning in the Tahoe Region is required to (a) reduce dependency on the automobile by making more effective use of existing transportation modes and of public transit to move people and goods within the Tahoe Region; and (b) reduce, to the extent feasible, air pollution caused by motor vehicles.
TRPA Thresholds (2007)	The following threshold that involves transportation issues is intended to reduce air quality problems: *Air Quality: Subregional Visibility & Nitrate Deposition.* Reduce vehicle miles of travel in the Tahoe Basin by 10 percent of the year-1981 base-year values.
TRPA Regional Plan Goals and Policies (2006)	The Transportation Element of the Goals and Policies establishes general goals to be further defined by the RTP. This element sets LOS standards of LOS D for urban roads and LOS D, with brief periods (no more than 4 hours) of LOS E, for signalized intersections. No standards exist for unsignalized intersections.
TRPA *Regional Transportation Plan* (1992)	The Goals and Policies Element of the RTP includes subelements applicable to all projects in the Tahoe Region. Some policies relevant to community plans are: (1) "Community…plans shall make specific recommendations for locating mass transit terminals and transfer points within the community plan…boundaries." (2) "TRPA shall encourage large employers to provide incentives to increase automobile vehicle occupancies." (3) "TRPA shall assist in the location and development of out-of-basin and in-basin park-and-ride lots."
TRPA Air Quality Plan (1995)	The AQP provides more detail than the RTP on strategies required to meet air quality–related goals.
TRPA Code of Ordinances (1998, 2001)	Projects must adhere to requirements in Chapter 14 of the Code for traffic considerations, including vehicle trip reduction targets, and requirements in Chapter 93 for traffic analysis; the Code sections require reducing significant impacts to a less-than-significant level.

Table 3.10-1 Transportation and Circulation Standards	
Plan/Policy	Standard/Criteria
U.S. 50 Transportation Concept Report (1998)	The TCR identifies Caltrans's long-term goals for the operating LOS on state highways.
El Dorado County General Plan (2004)	The *El Dorado County General Plan* provides traffic capacity and LOS criteria for various types of highways and intersections.
Notes: AQP = air quality plan; Caltrans = California Department of Transportation; Code = Code of Ordinances; LOS = level of service; RTP = regional transportation plan; TCR = transportation concept report Source: Data provided by KD Anderson & Associates in 2009	

Federal

No Federal plans, policies, regulations, or laws related to transportation and circulation are applicable.

State

The California Department of Transportation (Caltrans) is responsible for planning, designing, constructing, operating, and maintaining all State-owned roadways, including those in El Dorado County. Federal highway standards are implemented in California by Caltrans.

The TCR notes that the 20-year concept level of service (LOS) for the portion of U.S. 50 that runs in front of the study area is LOS F. LOS definitions are provided in Table 3.10-2 below. Caltrans District 3 considers the following to be significant project impacts:

- deterioration of State highway or intersection LOS beyond LOS D and
- vehicle queues at intersections that exceed existing lane storage.

Tahoe Regional Planning Agency

1987 Regional Plan

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin*. TRPA's *Regional Plan*, adopted in 1987, includes the Regional Transportation Plan–Air Quality Plan, which is designed to maintain the excellent air quality in the Tahoe Region and to reduce dependency on private automobiles.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The formulation of regional transportation goals and policies is a fundamental step in the transportation planning process. The Goals and Policies reflect the consideration of environmental, social, and economic factors in making transportation-related decisions.

Regional Transportation Goals

1. It is the goal of the Regional Transportation Plan to attain and maintain the Environmental Threshold Carrying Capacities and federal, state, and local transportation standards.

2. It is the goal of the Regional Transportation Plan to establish a safe, efficient, and integrated transportation system which reduces reliance on the private automobile, provides for alternative modes of transportation, and serves the basic transportation needs of the citizens of the Tahoe Region, supports the economic base of the Region in the movement of goods and people, and minimizes adverse impacts on man and the environment.

Regional Transportation Policies and Objectives

1. Plan for and promote land use changes and development patterns which will encourage the use of alternative transportation modes and minimize impacts on the existing transportation system.

   A. Community Plans shall promote land use development patterns and designs which will increase the ability to use public transportation, waterborne, bicycle and pedestrian facilities.

   B. New, expanded or revised developments and land uses shall fully mitigate their regional and cumulative traffic impacts.

   C. Parking for non-residential uses shall be the minimum/maximum required to meet the demand for parking generated by the use, except as may be offset by reducing parking demand through parking management and trip reduction programs.

   D. Driveways shall be designed and sited to minimize impacts on public transportation, adjacent roadways and intersections, bicycle and pedestrian facilities.

2. Develop and encourage the use of pedestrian and bicycle facilities as a safe and viable alternative to automobile use.

   A. Pedestrian and bicycle facilities shall be constructed, or upgraded, and maintained along major travel routes.

   B. Bicycle and pedestrian facilities in urbanized areas and along transportation routes used for commuting should be maintained to allow year-around use of the facilities.

3. Transportation System Management (TSM) measures shall be used to improve the efficiency of the existing transportation system.

   A. Traffic conflicts should be reduced by limiting or controlling access to major regional travel routes and major local road ways.

   B. Intersection improvements required to upgrade existing levels of service including lane restriping, turn lanes, channelization and traffic signals should be implemented when warranted.

   C. Roadway designs shall accommodate bicycle lanes and transit stops and reduce conflicts between vehicles and bicycle and pedestrians.

   D. Left-turn lanes and right-turn lanes shall be provided to reduce turning conflicts along major travel routes.

4. Limit improvements to the regional highway system to those necessary to meet the Goals and Policies of the Regional Plan.

   Level of service (LOS) criteria for the Region's highway system and signalized intersections during peak periods shall be:

   - Level of service "C" on rural recreational/scenic roads.
   - Level of service "D" on rural developed area roads.
   - Level of service "D" on urban developed area roads.
   - Level of service "D" for signalized intersections.
   - Level of service "E" may be acceptable during peak periods in urban areas, not to exceed four hours per day.

Code of Ordinances

Chapter 93 of the TRPA Code of Ordinances (TRPA 2008) includes guidelines and definitions for evaluating the impacts of additional development or transferred development and all changes in operation as defined in the chapter. The chapter defines the level of traffic increase that may be deemed to be insignificant (i.e., 100 additional daily vehicle trips), minor (i.e., 100–200 daily vehicle trips) or significant (i.e., greater than 200 daily vehicle trips). The chapter also identifies the breadth of the traffic analysis to be conducted for actions that are judged to be significant under these definitions.

Plan Area Statements

Traffic and transportation is not among the issue areas addressed by the Plan Area Statements for the study area.

Environmental Threshold Carrying Capacities

TRPA thresholds related to transportation address carbon monoxide, ozone, regional and subregional visibility, and nitrate deposition. Numerical standards have been established for each of these parameters, in addition to management standards that are intended to assist in attaining the thresholds. Management standards have been established for reducing wood smoke, maintaining levels of oxides of nitrogen, reducing U.S. 50 traffic volumes, and reducing vehicle miles traveled (VMT). Two thresholds established for air quality are based on information relating to transportation and are identified below.

AQ-5—Traffic Volume. TRPA established thresholds for traffic volume to reduce the level of carbon monoxide in the Tahoe Basin. The indicator of TRPA's traffic volume program states that there shall be a 7 percent reduction in the daily traffic volume on the U.S. 50 corridor from the 1981 values. The 1981 traffic count was 25,173 vehicles; therefore, attainment of this standard requires a directional daily traffic count of fewer than 23,411 vehicles. TRPA evaluates this indicator by measuring the traffic volume on the Saturday of the President's Day holiday weekend between 4 p.m. and 12 midnight at a site immediately west of the intersection of U.S. 50 and Park Avenue in the city of South Lake Tahoe.

AQ-7—Vehicle Miles Traveled. TRPA adopted the VMT threshold in 1982 as both a water quality and air quality threshold. The TRPA thresholds for air quality, under both visibility and nitrate deposition, include the following management standard: "Reduce vehicle miles of travel by 10 percent of the 1981 base values." The indicator of TRPA's VMT threshold states that there shall be a 10 percent reduction in VMT below the 1981 summer day levels. The 1981 VMT was determined to be 1,648,466 VMT; therefore, the attainment level for this indicator would be 1,483,619 miles for a peak summer day. The 1981 estimate is a modeled value that has been calculated over the years using various travel demand software programs and interim annual methods based on traffic counts.

Level of Service Standards

The Transportation Element of TRPA's RTP-AQP also establishes traffic capacity and LOS criteria for various types of highways, and an operational LOS for signalized intersections (TRPA 1995). The LOS describes the quality of traffic flow through intersections, using a scale from A to F. This analysis procedure is a measure of several factors: operating speeds, freedom to maneuver, traffic interruptions, and average delay for vehicles at intersections. The LOS descriptions provided in Table 3.10-2 summarize the quality of traffic flow for each LOS rating. Intersections operating at LOS A, B, or C function effectively; traffic can move relatively freely. At LOS D, delay is more noticeable, with a traffic condition characterized by heavy but stable traffic flows. LOS E represents conditions where traffic volumes are at or near capacity, resulting in notable delays and average speeds that are one-third the uncongested speed or lower, frequently requiring motorists to wait more than one signal cycle. Finally, LOS F represents traffic volumes in excess of the intersection's capacity, indicates extreme vehicle delay, and is characterized by very slow traffic speeds (stop-and-go) and long delays (more than 1 minute) and queues at signalized intersections (Table 3.10-2).

Table 3.10-2
Definitions of Levels of Service

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
A	Uncongested operations; all queues clear in a single signal cycle. Delay ≤ 10.0 sec/veh.	Little or no delay. Delay ≤ 10.0 sec/veh.	Completely free flow.
B	Uncongested operations; all queues clear in a single cycle. Delay > 10.0 sec/veh and ≤ 20.0 sec/veh.	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh.	Free flow; presence of other vehicles noticeable.
C	Light congestion; occasional backups on critical approaches. Delay > 20.0 sec/veh and ≤ 35.0 sec/veh.	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh.	Ability to maneuver and select operating speed affected.
D	Significant congestion at critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec/veh and ≤ 55.0 sec/veh.	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh.	Unstable flow; speeds and ability to maneuver restricted.
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec/veh and ≤ 80.0 sec/veh.	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh.	At or near capacity, flow quite unstable.
F	Total breakdown, stop-and-go operation. Delay > 60.0 sec/veh.	Intersection blocked by external causes. Delay > 50 sec/veh.	Forced flow, breakdown.

Notes: sec/veh = seconds per vehicle
Sources: TRB 2000

El Dorado County

The Transportation and Circulation Element of the *El Dorado County General Plan* (El Dorado County 2004) identifies roadway improvement standards as minimum LOS goals. The following policy in the general plan is relevant to transportation and circulation within the study area.

- **Policy TC-XD:** LOS for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural

Regions except as specified in Table TC-2 or, after December 31, 2008, Table TC-3. The volume to capacity ratio of the roadway segments listed in Tables TC-2 and TC-3 as applicable shall not exceed the ratio specified in that table. LOS will be as defined in the latest edition of the Highway Capacity Manual (Transportation Research Board, National Research Council) and calculated using the methodologies contained in that manual. Analysis periods shall be based on the professional judgment of the Department of Transportation which shall consider periods including, but not limited to, Weekday Average Daily Traffic (ADT), a.m. Peak Hour, and p.m. Peak hour traffic volumes.

El Dorado County considers deterioration of operations of county facilities (intersections, county roads) beyond LOS D to be a significant project impact.

ENVIRONMENTAL SETTING

Existing traffic conditions are the baseline from which potential project impacts are measured. Existing traffic conditions are presented in terms of the roadway system network, traffic volumes, and current traffic operating conditions. The project location and study area roadway network are depicted in Exhibit 3.10-1.

Roadway System

Highways in the Project Vicinity

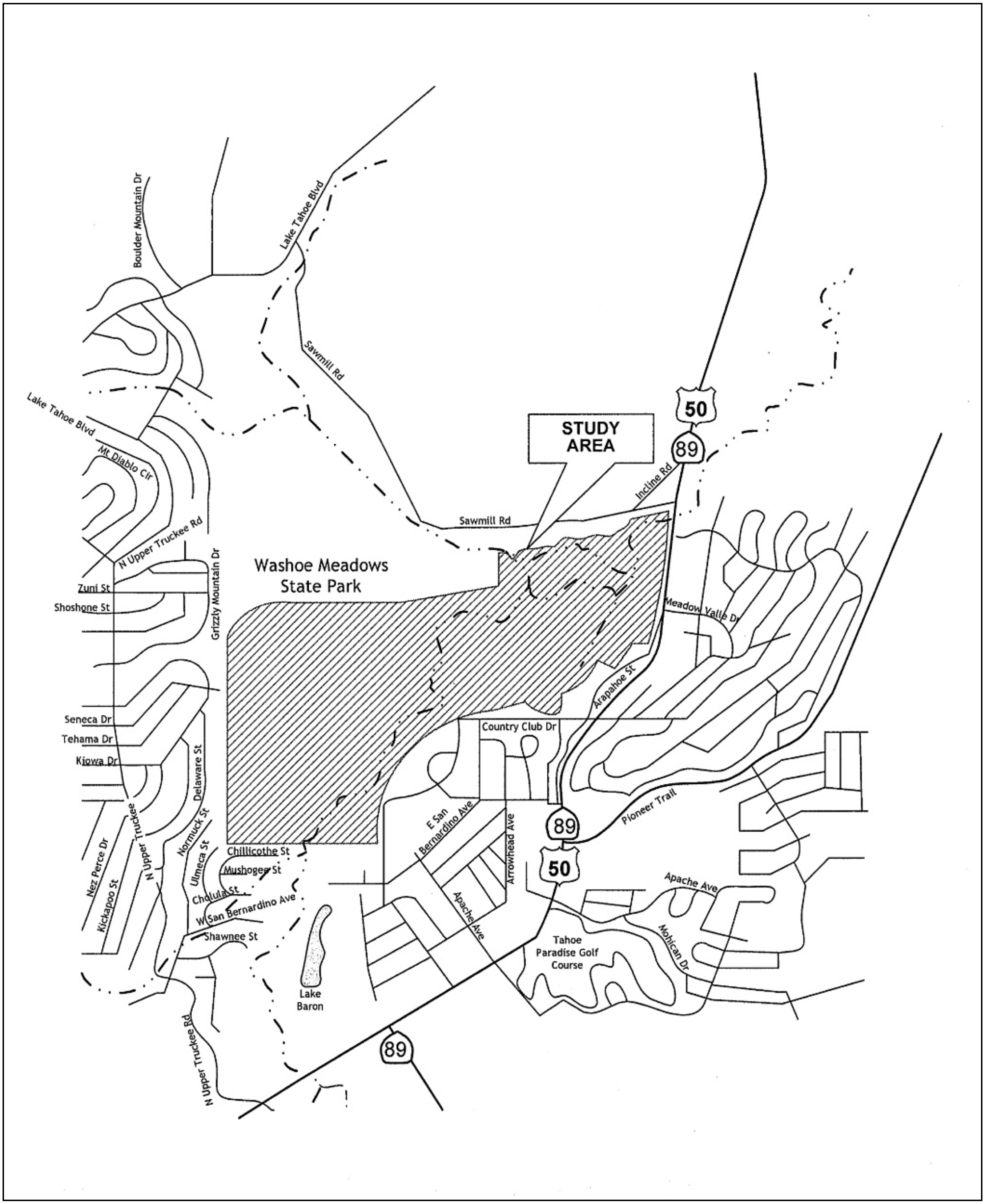
U.S. 50 is the primary route providing access to and through South Lake Tahoe. South of its intersection with State Route (SR) 89, U.S. 50 is also designated as Emerald Bay Road. At the signalized intersection of Emerald Bay Road and Lake Tahoe Boulevard (at the South Tahoe “Y”), U.S. 50 becomes Lake Tahoe Boulevard, then the highway heads east through South Lake Tahoe. At the South Tahoe “Y,” SR 89 splits from U.S. 50 and continues north.

The physical characteristics of U.S. 50 in the Tahoe Basin vary. As the highway enters the Tahoe Basin from the west, U.S. 50 is a two-lane roadway until it reaches approximately F Street in South Lake Tahoe. The posted speed limit along the two-lane segment ranges from 45 to 55 miles per hour (mph). At F Street, U.S. 50 becomes a four-lane highway with a continuous center left-turn lane and a posted speed limit of 40 mph, and this configuration continues through South Lake Tahoe into Nevada. TRPA staff were contacted and asked to identify LOS classification for this and all other roads in the study area. U.S. 50 is an Urban Developed Area road, and the LOS D minimum applies.

SR 89 joins U.S. 50 in Meyers, south of both the South Lake Tahoe city limits and the study area, and operates as a single roadway with U.S. 50 until the intersection with Lake Tahoe Boulevard, where SR 89 and U.S. 50 split and continue north and east, respectively, as described above. SR 89 is a two-lane roadway in the Tahoe Basin, except between F Street and West Way, where the roadway is four lanes. Posted speed limits on SR 89 in the project vicinity range from 40 to 50 mph. SR 89 continues north along the west side of the lake to Tahoe City, then heads northwest toward Truckee, Interstate 80, and points beyond. SR 89 is an Urban Developed Area road, and the LOS D minimum applies.

Other Roadways and Local Streets in the Project Vicinity

North Upper Truckee Road provides a route to the west side of the study area from a stop-controlled “T” intersection at Lake Tahoe Boulevard (U.S. 50). North Upper Truckee Road is a two-lane roadway with a posted speed of 40 mph. Bike lanes exist on both sides of the road. North Upper Truckee Road is an Urban Developed Area road, and the LOS D minimum applies.



Source: KD Anderson 2009

Roadways and Highways in the Project Vicinity **Exhibit 3.10-1**

San Bernardino Avenue, Cholula Street, and Chilicothe Street combine to link North Upper Truckee Road with the west side of the study area. All are two-lane roadways with unpaved shoulders that provide access to the residential area east of North Upper Truckee Road. The speed limit on these roads is 25 mph. All are Urban Developed Area roads, and the LOS D minimum applies.

Other local streets exist in the vicinity of the study area, but these streets provide less direct routes to the study area. Seneca Drive, Kiowa Drive, Delaware Street, Normuk Street, and Ulmeaca Street extend east from North Upper Truckee Road toward the study area but do not connect to designated access points for project construction. Bakersfield Street, Modoc Way, Hopi Avenue, Apache Avenue, San Diego Street, and Arapahoe Street link the residential area south of the study area with U.S. 50 as well, but do not provide direct access to designated construction access points. These two-lane roads have speed limits of 25 mph. All are Urban Developed Area roads, and the LOS D minimum applies.

Country Club Drive is a two-lane local street that provides access to residences along the south side of the Lake Tahoe Golf Course. Country Club Drive intersects U.S. 50 at an intersection controlled by stop signs on the Country Club Drive approaches. The speed limit on Country Club Drive is 25 mph. Country Club Drive is an Urban Developed Area Road, and the LOS D minimum applies.

Meadow Vale Lane is a two-lane local street that provides access to the residential area across U.S. 50 from the golf course. Meadow Vale Lane intersects U.S. 50 at the existing golf course access point. That intersection is controlled by stop signs on the Meadowvale Lane approach and at the golf course exit. The speed limit on Meadow Vale Lane is 25 mph. Meadow Vale lane is an Urban Developed Area road, and the LOS D minimum applies.

Sawmill Road is a two-lane collector street that connects Lake Tahoe Boulevard with Emerald Bay Road (U.S. 50) through the area north of the golf course. Sawmill Road intersects U.S. 50 at a “T” intersection controlled by a stop sign on the Sawmill Road approach. A left-turn lane is located on U.S. 50 at this intersection. The speed limit on Sawmill Road is 25 mph. Sawmill Road is a Rural Developed Area Road, and the LOS D minimum applies.

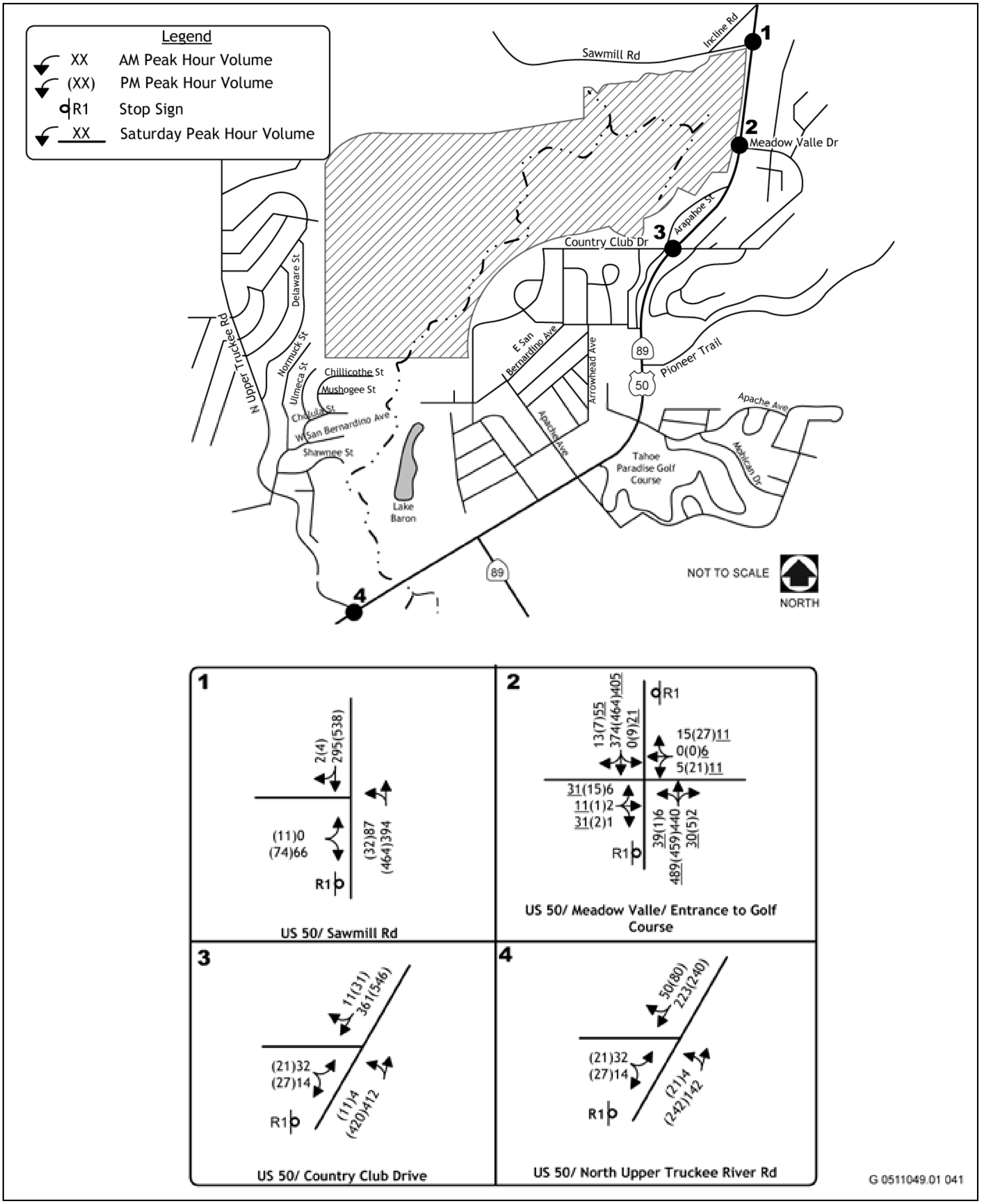
Existing Traffic Volumes

Traffic-count data were collected for this analysis. Weekday peak-hour turning movements were counted in September 2007 at the four study intersections that would provide access to golf course or construction areas. A Saturday peak-hour count also took place at the golf course entrance in September 2007. The intersections in this area that were selected for analysis were those that carry the most traffic and are expected to incur the highest volume of construction traffic. The new September counts were factored to peak-month (August) values based on seasonal factors provided by TRPA. Exhibit 3.10-2 identifies these peak-hour traffic volumes.

Daily traffic volume was also counted in July 2008 on streets that could be expected to be used by construction traffic. These counts were also factored to weekday peak-month levels, but because traffic volume is nearly the same in July as in August, the observations were simply rounded upward.

Intersection Levels of Service

As described under “Level of Service Standards” in the “Regulatory Setting” section above, intersections are routinely evaluated in terms of LOS, a measure of driving conditions and vehicle delay, with LOS ranging from A (best) to F (poorest). For this project, signalized intersections were evaluated consistent with the Operations Method from the Transportation Research Board’s 2000 *Highway Capacity Manual* (TRB 2000) using TRAFFIX software. This method evaluates the amount of time a green signal is available at each traffic approach and the total intersection capacity used by the traffic demand, and assigns an LOS based on the average delay that drivers would experience at the intersection during the peak hour (Table 3.10-2).



Source: KD Anderson 2009

Existing Traffic Volumes and Lane Configurations **Exhibit 3.10-2**

Unsignalized intersections were evaluated using the methodology from Chapter 9 of the 2000 *Highway Capacity Manual*. At these intersections, each turning movement that yields to an opposing movement is evaluated separately and assigned an LOS based on the relative ability of turning traffic to find adequate gaps in conflicting traffic flows.

Existing LOS was calculated for each study intersection (Table 3.10-3). Motorists attempting to turn onto U.S. 50 at the unsignalized study intersections experience delays that generally indicate LOS C or better conditions on weekdays. Delays at the golf course access point reach LOS D on weekends when both golf course use and U.S. 50 traffic volumes are high.

Daily Traffic Volumes

To provide additional perspective on current traffic conditions, 24-hour traffic volume counts were conducted in July 2008 on selected roads that could provide construction access to the site. These volumes are reported in Table 3.10-4 and Exhibit 3.10-2 and rounded to peak-month (August) values. Current daily traffic volumes reported by Caltrans for U.S. 50 are also noted.

Pedestrian/Bicycle Facilities

The *Lake Tahoe Regional Bicycle and Pedestrian Master Plan* (TMPO 2006) provides information about bicycle and pedestrian trails and paths in and around the study area. The facilities identified in the master plan are noted in Table 3.10-5.

Transit Service

Existing transit service in the Tahoe Basin is provided by four publicly operated transit systems, various tourist-oriented trolley services, and several privately operated shuttle systems and taxi services. On the South Shore, the South Tahoe Area Transit Authority operates the BlueGo Coordinated Transit System in El Dorado County, including Meyers and South Lake Tahoe, and western Douglas County, Nevada. BlueGo Route 40 runs along U.S. 50, North Upper Truckee Road and Lake Tahoe Boulevard from the South Y (Emerald Bay Boulevard/Lake Tahoe Boulevard) transit center and continues along Lake Tahoe Boulevard to Stateline, Nevada. In addition to this fixed-route service, the BlueGo system provides demand-responsive service within portions of El Dorado County, including Meyers and South Lake Tahoe.

Parking

The Lake Tahoe Golf Course provides parking for guests and employees. The paved parking lot off U.S. 50 can accommodate approximately 115 vehicles. Unpaved areas on both sides of the golf course entrance are used for additional parking. There are no parking facilities associated with Washoe Meadows SP.

Table 3.10-3
Existing Levels of Service during Peak Hours

Location	Control	Weekday Peak-Hour Levels of Service: a.m. Peak Hour (7:00 to 9:00 a.m.) Average Delay (sec/vehicle)	a.m. Peak Hour LOS	Weekday Peak-Hour Levels of Service: p.m. Peak Hour (4:00 to 6:00 p.m.) Average Delay (sec/vehicle)	p.m. Peak Hour LOS	Saturday Peak-Hour Levels of Service (Noon to 2:00 p.m.) Average Delay (sec/vehicle)	Saturday LOS
U.S. 50/Sawmill Road							
(overall)[1]	EB Stop	(1.7)	(A)	(1.4)	(A)		
Northbound left turn		8.2	A	8.8	A	–	–
Eastbound left and right turn		10.6	B	15.6	C		
U.S. 50/Golf Course/Meadow Vale Drive							
(overall)		(0.6)	(A)	(0.9)	(A)	(2.8)	(A)
Northbound left turn	EB/WB	8.2	A	8.4	A	8.5	A
Southbound left turn	Stop	–	–	8.4	A	8.7	A
Eastbound left, through, and right turn		18.7	C	22.8	C	27.7	D
Westbound left, through, and right turn		13.5	B	17.7	C	24.3	C
U.S. 50/Country Club Drive							
(overall)	EB Stop	(0.9)	(A)	(0.9)	(A)		
Northbound left turn		8.1	A	8.8	A	–	–
Eastbound left and right turn		15.7	C	17.8	C		
U.S. 50/North Upper Truckee Road							
(overall)	EB Stop	(2.5)	(A)	(3.1)	(A)		
Northbound left turn		7.9	A	8.0	A	–	–
Eastbound left, through, and right turn		12.6	B	18.5	C		

Notes:

EB = eastbound; LOS = level of service; sec/vehicle = seconds per vehicle; WB = westbound; U.S. 50 = U.S. Highway 50

[1]Values in parentheses are the "overall" LOS for the intersection.

Source: Calculations conducted by KD Anderson & Associates in 2008

Table 3.10-4 Current Daily Traffic Volumes				
Location			Weekday Daily Volume	
Road/Street	From	To	July	Peak Month
U.S. 50	SR 89	Pioneer Trail		17,600
	Pioneer Trail	Sawmill Road		18,000
Sawmill Road	Incline Road	U.S. 50	1,184	1,200
Country Club Drive	Arapahoe	U.S. 50	669	670
North Upper Truckee Road	U.S. 50	Otomites Street	1,923	1,950
San Bernardino Avenue	U.S. 50	Cholula Street	494	500

Notes: SR = State Route; U.S. 50 = U.S. Highway 50
Source: Calculations conducted by KD Anderson & Associates in 2008

Table 3.10-5 Bicycle/Pedestrian Facilities			
Facility	Street	From	To
Class I/Shared Use	North side of U.S. 50 and west side of Sawmill Road*	SR 89	Pioneer Trail and Sawmill Road
		U.S. 50	Lake Tahoe Boulevard
Class II Bike Lane	North Upper Truckee Road	U.S. 50	Mt. Rainier Drive
	Lake Tahoe Boulevard	Angora Creek Drive	Boulder Mountain Drive

* To be built before project construction
Note: SR = State Route; U.S. 50 = U.S. Highway 50
Source: TMPO 2006

3.10.2 Environmental Consequences

Significance Criteria

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, effects on thresholds of the Tahoe Regional Planning Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, an alternative would result in a significant impact on transportation and circulation if it would result in:

- a change in LOS from A, B, C, or D (existing conditions) to E or F (existing plus project conditions);
- a substantial traffic safety concern; or
- substantial deterioration of roadway surfaces or structural sections caused by project traffic.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on transportation and circulation if it would:

- generate 100 or more new Daily Vehicle Trip Ends (DVTE);
- result in changes to existing parking facilities or demand for new parking;
- substantially affect existing transportation systems, including highway, transit, bicycle, or pedestrian facilities;
- alter present patterns of circulation or movement of people and/or goods;
- alter waterborne, rail, or air traffic; or
- increase traffic hazards to motor vehicles, bicyclists, or pedestrians.

METHODS AND ASSUMPTIONS

During the construction phase of the project, the relative impact of implementing an alternative has been determined by estimating the amount of traffic associated with construction activities within the study area and superimposing that traffic onto current traffic volumes. After construction, existing golfing activities at the site would be perpetuated, reduced, or eliminated under various alternatives. Because the traffic volumes associated with regular post-project activities would be approximately equal to or less than existing traffic volumes, quantitative analysis of resulting traffic operations under current and cumulative conditions is not required. However, a qualitative analysis is presented below.

Trip Generation

The amount of automobile and truck traffic associated with implementation of the project alternatives would vary throughout the construction season as different activities occur. To ensure that the magnitude of traffic impacts is not underestimated for this analysis, it assumes the maximum probable concurrent employment on the site and maximum concurrent truck activity as the construction traffic level to evaluate.

Construction Employee Traffic

For this analysis it has been assumed that each construction worker would drive a personal vehicle to the construction site. In reality, it is likely that some employees within individual trade groups would informally carpool to the job site; as a result, this assumption yields a conservatively high estimate of site trip generation. It has also been assumed that on a given day 100 percent of the construction employment arrives at the project site during the a.m. peak hour, and that 100 percent of the on-site construction employment departs during the p.m. peak hour. In reality, it is likely that some employees would arrive and depart during periods outside of peak commute hours. Thus, this analysis provides a conservatively high estimate of peak-hour construction employee traffic.

Construction Truck Traffic

Trucks would travel to and from the study area over the life of the construction phase. The amount of truck activity has been estimated based on a review of preliminary construction quantities for each aspect of the project alternatives. The number of truckloads needed to accommodate identified quantities was estimated over the construction season and spread throughout the typical construction day to forecast hourly truck traffic.

From the standpoint of traffic impacts, large trucks have a disproportionate impact on operating LOS and on impacts on the structure of the roadway. The length and acceleration/deceleration characteristics of large trucks exceed those of regular passenger vehicles. Standard engineering practice is to convert each truck to a number of Passenger Car Equivalents (PCEs) and to use that adjusted volume in LOS calculations. PCE factors range from 2.0 to 4.0, and for this analysis, a PCE of 4.0 has been assumed for each truck.

Project Traffic After Implementation

The traffic generated by golf course facilities created or remaining under each alternative would be approximately the same or less than current conditions. For alternatives that continue an 18-hole, regulation-length course, the number of golfers would be also continue to be the approximately same as under existing conditions. This conclusion is confirmed by the economic study conducted for the EIR/EIS/EIS (Appendix E). Traffic from golf course employees would increase slightly under Alternatives 2 and 4 and decreases under Alternatives 3 and 5. However, the increase under Alternative 2 or 4 (i.e., up to four additional employees) would generate fewer trips (i.e., 8 daily trip ends) than the 100 trip minimum threshold employed by TRPA. Regular site traffic would be less than existing traffic under alternatives that would eliminate the golf course or provide a golf course with shorter or fewer holes, based on the results of the economic study (Appendix E). In each case, the net traffic increase under regular conditions would be well below the minimum level employed by TRPA for determining the need for traffic impact analysis (i.e., less than 100 daily trips). Although a quantitative analysis of traffic related to golf course operations is not presented, a qualitative comparison is discussed.

Trip Distribution/Assignment

Regional Trip Distribution

It is necessary to identify the traffic routes that would be used under each project alternative, and the regional distribution of project trips is an element in that process. It is assumed that the relative regional distribution of the project's employee and construction truck traffic would differ, because employee traffic would be oriented to residential centers throughout the Lake Tahoe/western Nevada area while truck traffic would be oriented to the sources of imported materials or the disposal sites for exported materials.

The relative assumptions made about employee and truck distribution are identified in Table 3.10-6. As noted, the primary route for truck traffic would be to the east on U.S. 50 because this is the route to area landfills. Imported materials could come from either direction (e.g., Gardnerville, Placerville), but would likely approach via U.S. 50. Employee traffic could originate in areas surrounding the site, but would also be heaviest to and from the east, based on the location of residential areas.

Table 3.10-6
Project Trip Distribution

Direction	Route	Percentage of Total Traffic	
		Trucks	Employees
East	U.S. 50	80	55
East	Pioneer Trail	0	10
West	U.S. 50	20	10
North	North Upper Truckee Road	0	10
South	SR 89	0	15
	Total	**100%**	**100%**

Source: Data provided by KD Anderson & Associates in 2009

Trip Assignment

Once the regional orientation of project traffic has been identified, traffic is assigned to the street system in the vicinity. Over the course of the construction schedule, various roads can be expected to be used to access individual work zones, and staging areas have been identified on both sides of the golf course under each alternative. The primary staging area would be located near the golf course driving range and unpaved parking area, and this analysis assumes that construction employee commute traffic would be destined for that location. Localized truck traffic could result on various roads as materials are hauled to specific work zones under each alternative. The exact breakdown of travel on each route would vary from day to day, and a "composite" trip assignment reflecting the average use on each route over the duration of the project has been employed for this analysis.

Level of Service Analysis

The relative impact of project construction traffic during peak traffic hours has been determined by superimposing project automobile and truck traffic onto current background traffic volumes and calculating resulting LOS.

Daily Traffic Volumes

To provide additional perspective on project impacts, the amount of traffic added to local streets during construction on a daily basis has been identified. These forecasts have been identified in terms of automobile and truck traffic that would occur over the duration of construction and "random" traffic that may occur occasionally when construction takes place in areas that make use of specific access routes. This additive traffic has been compared to existing 24-hour traffic volume counts.

Traffic Safety/Pavement Deterioration

At various times over the life of the project's construction phase, truck traffic would be added to the roads that link designated project area access locations with the regional highway network. Although the effect of this traffic on overall traffic operations and LOS has been evaluated, it is also important to consider the effects of trucks on the conditions of these roads, as well as truck maneuvering requirements that could affect traffic safety. Because of their weight, trucks can have a disproportionate impact on roadway pavement sections and can accelerate the need for maintenance. Because the turning paths taken by large trucks exceed those of automobiles, trucks may encroach into opposing lanes or leave the pavement when negotiating turns on narrow streets. The effects of truck circulation on local streets have been evaluated based on the general width of key roads and intersections used under each alternative and on the availability of pedestrian/bicycle facilities along haul routes.

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Waterborne, rail, or air traffic—No alternative would result in increasing or creating waterborne, rail, or air traffic. Therefore, the proposed project alternatives would have no impact on such traffic, and these issues are not discussed further in the EIR/EIS/EIS.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.10-1 (Alt. 1) **Increased Construction Traffic on the Local and Regional Circulation System**. *No construction traffic would be generated under Alternative 1, so no traffic would be added to major roads in the project vicinity. Because current operating LOS at key intersections would not change,* ***no impact*** *would occur.*

Under Alternative 1, LOS standards would not be exceeded because existing activities would continue at the same level into the future and no project construction would be required. No on-site construction would be needed for the No Project/No Action Alternative, because river restoration and golf course reconfiguration would not occur. Site maintenance traffic would continue to operate as it does today (i.e., for fuels management and repairs to the river or golf course), which involves trucks and other vehicles that are smaller and lighter than construction trucks; therefore, LOS would remain comparable to current conditions. Potential emergency construction may be conducted as necessary. However, the nature and extent of these unforeseeable activities are unknown, and such activities would not directly result from implementing Alternative 1. No impact would occur.

No mitigation is required.

IMPACT 3.10-2 (Alt. 1) **Contribution to Deterioration of Local Streets**. *No construction would occur under Alternative 1, so additional truck traffic on local roads and across bicycle trails in the project vicinity would not occur. Because traffic volumes would not change, Alternative 1 would not contribute to additional deterioration of pavement sections on streets and bicycle trails. This impact would be* ***less than significant****.*

Under Alternative 1, truck traffic would only be associated with maintenance and fuels management of Lake Valley SRA and Washoe Meadows SP and with maintenance of and repairs to the golf course and the river, similar to existing conditions. Trucks would continue to use the roads surrounding the study area. However, these trips would use the golf course's entrance or access gates within Washoe Meadows SP. The amount of truck traffic on local streets that is related to Alternative 1 would be similar to existing conditions, so the rate of pavement deterioration would not change. This impact would be less than significant.

No mitigation is required.

IMPACT 3.10-3 (Alt. 1) **Potential for Conflicts between Construction Traffic and Local Traffic, Pedestrians, and Bicycles***. Construction truck traffic would not be added under Alternative 1 to local roads in the project vicinity. Because traffic volumes would not change, additional conflicts with pedestrians and bicyclists would not be created. This impact would be* ***less than significant****.*

Under Alternative 1, truck traffic would only be associated with maintenance and fuels management of Lake Valley SRA and Washoe Meadows SP and with maintenance of and repairs to the golf course and the river, similar to existing conditions. Golf course operational traffic would also continue similar to existing conditions. Trucks and other traffic would continue to use the roads surrounding the study area. However, these trips would use the golf course's clubhouse access to U.S. 50 or access gates within Lake Valley SRA and Washoe Meadows SP. The amount of truck traffic related to Alternative 1 on local streets would be similar to the amount under existing conditions, so the potential for traffic conflicts with pedestrians and bicycles would not change. This impact would be less than significant.

No mitigation is required.

IMPACT 3.10-4 (Alt. 1)	Operational Traffic Impacts on the Local and Regional Circulation System*. The continuing operation of a golf course under Alternative 1 would attract traffic to Lake Valley SRA, but this traffic volume would be the same as the current volume of traffic associated with the golf course. Therefore,* **no impact** *would occur.*

Under Alternative 1 current operational activity at the golf course would continue; access would remain in the same location, and the volume of traffic at the site would not differ from the current volume. Current traffic volumes and travel patterns would remain as noted in Table 3.10-4 and Exhibit 3.10-2. LOS would not change as a result of Alternative 1 and would remain as noted in Table 3.10-3. For these reasons, no impact would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.10-1 (Alt. 2)	Increased Construction Traffic on the Local and Regional Circulation System*. Construction under Alternative 2 would add traffic to major roads in the project vicinity, but current LOS would not change appreciably. This impact would be* **less than significant***.*

Construction under Alternative 2 is expected to take place over 3 to 4 years. As noted in Table 3.10-7, the maximum on-site construction employment under Alternative 2 is 32 persons. Thus, 32 inbound trips are expected to be generated in the a.m. peak hour and 32 outbound trips are expected in the p.m. peak hour. The estimated total number of truckloads is 5,758 over the life of Alternative 2. The largest number of truckloads would be hauled during the first year when 2,125 loads are projected. During that year, 42 truckloads per day could be hauled to or from the study area.

Table 3.10-7
Traffic Characteristics of Alternative 2 Construction Phase

Description	Alternative 2
Total cubic yards of export over the life of the project	7,850
Total cubic yards of import over the life of the project	76,450
Total external truckloads over the life of the project @ 15 cu. yd./truck	5,758
Maximum annual truckloads in highest year	2,125
Duration of haul (varies)	24–108 days
Average daily truckloads	42
Highest hourly truck trips (10-hour day)	5 in, 5 out
Maximum on-site employment	32
Highest hourly employee traffic	a.m. 32 inbound, p.m. 32 outbound

Note: cu. yd./truck = cubic yards per truck
Source: Data provided by KD Anderson & Associates in 2009

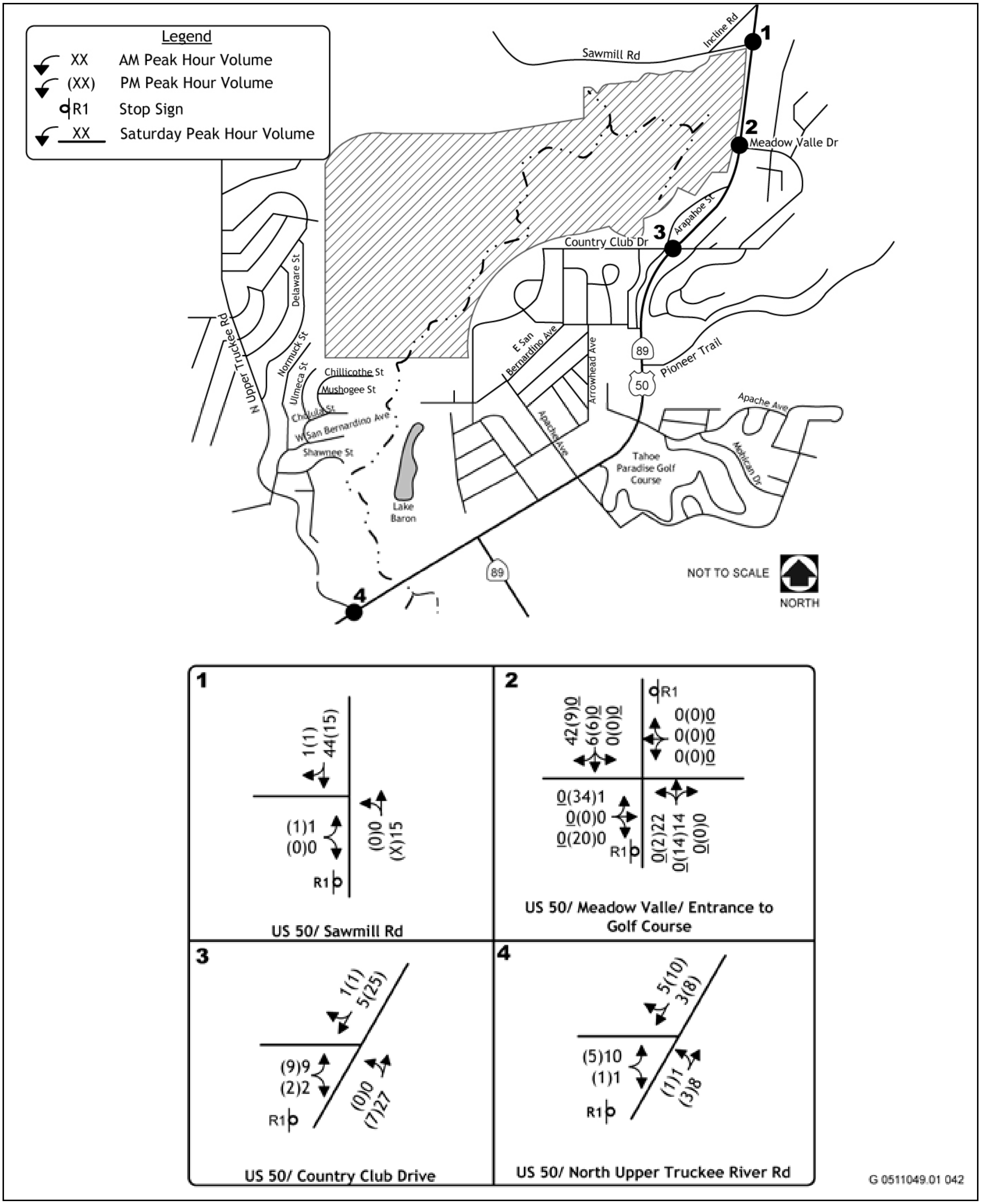
Table 3.10-8 summarizes peak-hour and daily trip generation for Alternative 2 on both a vehicle and PCE basis. Alternative 2 would add 20 PCEs during both the a.m. and p.m. peak hours.

Table 3.10-8 **Peak-Hour and Daily Trip Generation Estimates for Alternative 2 Construction Phase**		
Description	In	Out
a.m. truck trips	5	5
a.m. employee trips	32	0
Total a.m. trips (vehicles)	37	5
Total a.m. PCEs	20	20
p.m. truck trips	5	5
p.m. employee trips	0	32
Total p.m. trips (vehicles)	5	37
Total p.m. PCEs	20	20
Total daily vehicles (employees, trucks, and misc. [10%])	**87**	**87**
Total daily PCEs	**168**	**168**

Note: PCE = Passenger Car Equivalent
Source: Data provided by KD Anderson & Associates in 2009

Localized truck traffic could result as materials are hauled to specific work zones under Alternative 2. Truck traffic destined for the main staging area would enter via the golf course entrance on U.S. 50. However, supplies and materials that would be delivered directly to various locations in the work area may enter via Sawmill Road, the golf course entrance, Country Club Drive, and the western Chilicothe Street, Cholula Street, and San Bernardino Street route. Although trucks would be noticeable on these routes at various times over the construction period, they would not represent an appreciable volume that affects traffic operation and congestion, as measured on a daily or peak-hour basis. Resulting construction-related traffic volumes under Alternative 2, expressed as project PCEs, are shown in Exhibit 3.10-3.

The amount of truck traffic on each haul route over the life of Alternative 2 has also been estimated. As noted in Table 3.10-9, approximately 57 percent of the 5,758 truckloads would enter via the golf course entrance and exit on Country Club Drive. Approximately 29 percent of the materials hauled to and from the site under Alternative 2 would use the Chilicothe Street access.



Source: KD Anderson 2009

Construction-Related Traffic Volumes under Alternative 2, Expressed as Passenger Car Equivalents

Exhibit 3.10-3

Access	Inbound Trips	Percent of Total	Outbound Trips	Percent of Total
Sawmill Road	381	7	386	7
Golf Course Entrance	3,298	57	409	7
Country Club Drive	409	7	3,299	57
Chilicothe Street	1,670	29	1,665	29
Total	**5,758**	**100**	**5,760**	**100**

Table 3.10-9
Truck Trip Assignment for Alternative 2 Construction Phase

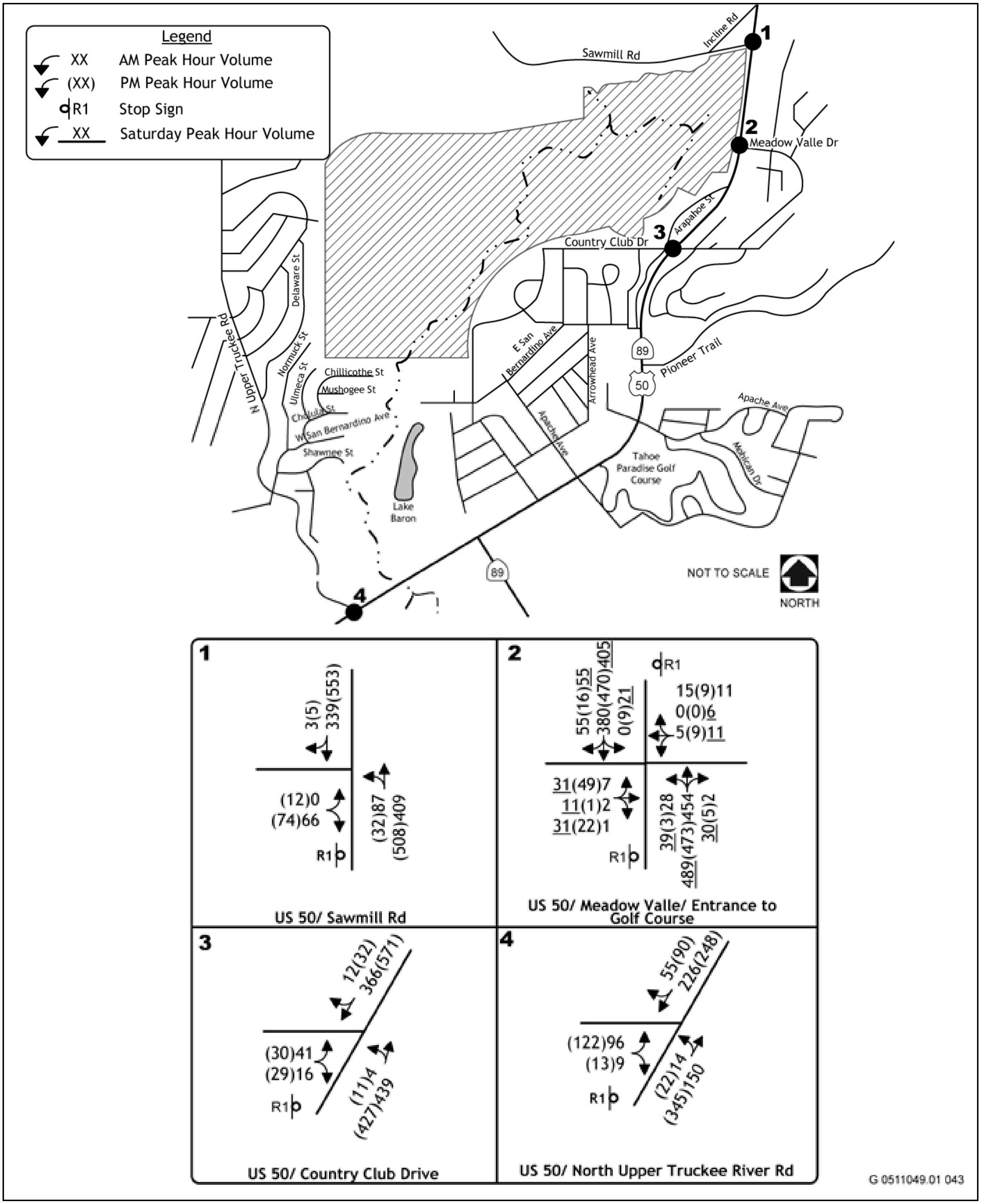
Source: Data provided by KD Anderson & Associates in 2009

Exhibit 3.10-4 illustrates existing traffic volumes plus construction-related traffic volumes associated with Alternative 2, again expressed in terms of project PCEs. Table 3.10-10 identifies peak-hour LOS at intersections in the project vicinity during the weekday a.m. and p.m. peak hour, respectively, under Alternative 2. No intersections are projected to operate with an overall or side-street LOS worse than LOS D. At intersections controlled by side-street stop signs, adding project traffic would incrementally increase the length of delays experienced by motorists waiting to turn onto U.S. 50, but project traffic would not change acceptable LOS to unacceptable conditions. Levels of service under Alternative 2 would be similar to those occurring under Alternative 1, the No Project/No Action Alternative.

Implementation of Alternative 2 would add truck and automobile traffic to roads in the vicinity of the study area throughout the construction period. Project truck traffic is compared to existing 24-hour traffic volume counts in Table 3.10-11.

Overall, the automobile and truck traffic generated during the construction phase of Alternative 2 would result in total volumes higher than existing conditions or those associated with Alternative 1. Resulting construction traffic volume increases would be noticeable by residents in the project vicinity, but the volume of traffic on local streets is not a measure of significance related to operation and congestion, and project trips would not result in operating conditions in excess of adopted standards for LOS at intersections. Thus, this impact would be less than significant.

No mitigation is required.



Source: KD Anderson 2009

Traffic Volumes under Existing Conditions plus Alternative 2 Construction-Related Traffic, Expressed as Passenger Car Equivalents **Exhibit 3.10-4**

Table 3.10-10
Peak-Hour Levels of Service—Existing Conditions plus Alternative 2 Construction Traffic

Location	Control	Weekday Peak-Hour Levels of Service							
		a.m. Peak Hour (7:00 to 9:00 a.m.)				p.m. Peak Hour (4:00 to 6:00 p.m.)			
		Existing		Existing plus Alternative 2		Existing		Existing plus Alternative 2	
		Average Delay (sec/veh)	LOS	Average Delay (sec/vehicle)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/vehicle)	LOS
U.S. 50/Sawmill Road									
(overall)	EB Stop	(1.7)	(A)	(1.6)	(A)	(1.4)	(A)	(1.4)	(A)
Northbound left turn		8.2	A	8.3	A	8.8	A	8.8	A
Eastbound left+right turn		10.6	B	11.1	B	15.6	C	16.3	C
U.S. 50/Golf Course/Meadow Vale Drive									
(overall)	EB/WB Stop	(0.6)	(A)	(0.8)	(A)	(0.9)	(A)	(2.3)	(A)
Northbound left turn		8.2	A	8.4	A	8.4	A	8.5	A
Southbound left turn		–	–	–	–	8.4	A	8.5	A
Eastbound left+through+right turn		18.7	C	21.3	C	22.8	C	26.9	D
Westbound left+through+right turn		13.5	B	14.2	B	17.7	C	19.0	C
U.S. 50/Country Club Drive									
(overall)	EB Stop	(0.9)	(A)	(1.1)	(A)	(0.9)	(A)	(1.2)	(A)
Northbound left turn		8.1	A	8.1	A	8.8	A	8.9	A
Eastbound left+right turn		15.7	C	16.8	C	17.8	C	20.1	C
U.S. 50/North Upper Truckee Road									
(overall)	EB Stop	(2.5)	(A)	(2.7)	(A)	(3.1)	(A)	(3.3)	(A)
Northbound left turn		7.9	A	7.9	A	8.0	A	8.1	A
Eastbound left+through+right turn		12.6	B	13.0	B	18.5	C	19.4	C

Notes: EB = eastbound; LOS = level of service; sec/veh = seconds per vehicle; U.S. 50 = U.S. Highway 50; WB = westbound
Source: Data provided by KD Anderson & Associates in 2009

Table 3.10-11
Daily Traffic Volumes—Existing Conditions plus Alternative 2 Construction Traffic

Location			Weekday Daily Volume					
			July			Peak Month		
Road/Street	From	To	Existing	Project Only	Total	Existing	Project Only (PCEs)	Total
U.S. 50	North Upper Truckee Road	SR 89				13,400	150	13,550
	SR 89	Pioneer Trail				16,800	172	16,972
	Pioneer Trail	Golf Course				17,200	237	17,437
	Golf Course	Sawmill Road				17,200	322	17,522
	Sawmill Road	H Street				16,000	336	16,336
Sawmill Road	Incline Road	U.S. 50	1,184	22	1,206	1,200	22	1,222
Country Club Drive	Arapahoe	U.S. 50	669	107	776	670	107	777
North Upper Truckee Road	U.S. 50	Otomites Street	1,923	110	2,033	1,950	110	2,060
San Bernardino Avenue	North Upper Truckee Road	Cholula Street	494	98	592	500	98	598

Notes: PCEs = Passenger Car Equivalents; SR = State Route; U.S. 50 = U.S. Highway 50
Source: Data provided by KD Anderson & Associates in 2009

IMPACT 3.10-2 (Alt. 2) **Contribution to Deterioration of Local Streets**. *Construction under Alternative 2 would add truck traffic on local roads and across bicycle trails in the project vicinity. This traffic has the potential to contribute to the accelerated deterioration of pavement sections on streets and bicycle trails. This impact would be* ***significant.***

Under Alternative 2, large trucks (e.g., water trucks, trucks and trailers, dump trucks) would be required to travel on and make several turns along the designated western route that would follow Chilicothe Street, Cholula Street, and San Bernardino Street to reach North Upper Truckee Road. The background traffic on these streets is low (i.e., less than 500 vehicles per day) and the number of trucks using the route is low (i.e., less than 42 per day); therefore, the potential for encounters between vehicles at local intersections would occur infrequently. However, if trucks need to maneuver around existing traffic, it is possible that trucks would move toward the edge of the roadway and could leave the pavement, which could result in damage to the pavement. Also, the weight of larger trucks and normal maneuvering at corners and road turns could accelerate pavement deterioration. Locations where effects on pavement would be expected include the northwest corner of the intersection of Chilicothe Street/Cholula Street, and the northwest corner of the intersection of Cholula Street/San Bernardino Avenue. Also, pavement damage from the weight of heavy trucks, such as trucks loaded with excavated material destined for disposal, could occur on any local roadways along the site access routes between the project and U.S. 50. Trucks using the Sawmill Road access would also cross the bicycle trail planned on the south side of the road. Truck traffic could damage the trail. Therefore, this impact would be significant.

Mitigation Measure 3.10-2 (Alt. 2): Survey Pavement Conditions and Repair Damage.

State Parks will prepare a baseline survey of pavement conditions along roads and bicycle trails on potential haul routes prior to initiating construction. The survey will include all local roads between the project and U.S. 50, where effects on pavement would be expected. This information shall be used as the basis for indentifying and repairing any damage caused by project related large truck traffic at the end of the project. State Parks will also monitor pavement conditions each year and make improvements, as needed, to ensure the safety of motorists, pedestrians, and bicyclists.

Because State Parks will repair road damage caused by project related traffic during and after construction with implementation of Mitigation Measure 3.10-2 (Alt. 2), Impact 3.10-2 (Alt. 2) would be less than significant.

IMPACT 3.10-3 (Alt. 2) **Potential for Conflicts between Construction Traffic and Local Traffic, Pedestrians, and Bicycles**. *Construction under Alternative 2 would add short-term truck traffic on local roads in the project vicinity. This traffic has the potential to create conflicts with local traffic, pedestrians, and bicyclists. This impact would be* ***significant.***

Under Alternative 2, large trucks would be required to travel on local streets between the project and U.S. 50, including the need to make several turns. The construction access to the site includes the designated western haul route that would follow Chilicothe Street, Cholula Street, and San Bernardino Street to reach North Upper Truckee Road and U.S. 50. Other automobiles, pedestrians, or bicyclists present along those streets and at the local intersections could encounter potential conflicts with construction trucks. “Conflicts” in this context mean changes to normal travel behavior in response to encountering construction traffic, such as traveling outside designated lanes, stopping more quickly than normal, or other maneuvering actions to avoid a hazard. Along these routes the potential for conflicts between pedestrians, bicyclists, and trucks would be most acute when large trucks are involved. Regular “bobtail” dump trucks would not be expected to create substantial conflicts, but the turning requirements of large five-axle truck/trailer combinations could create conflicts. Potential risks to traffic, bicycle, and pedestrian safety would occur where there is a potential for such conflicts.

Trucks that arrive and depart via Sawmill Road are also a consideration. Trucks would cross the new bicycle trail proposed along the south side of Sawmill Road, creating the possibility of conflicts between trucks and cyclists.

On days with particularly frequent, heavy-truck use (i.e., more than 10 trucks per hour), the potential for conflicts and risks to cyclist safety would be the greatest. This impact would be significant.

Under Alternative 2 the unpaved parking areas would be paved to create an additional 89 paved parking spaces and regular automobile parking/circulation and parking access would occur near the Sawmill bike trail along U.S. 50. The proposed paving is not expected to create conflicts between cyclists and on-site automobiles. Local access and volume of the lot would likely remain where it exists today. Therefore, no impact would occur related to the proposed parking area.

Mitigation Measure 3.10-3 (Alt. 2): Construction Traffic Management Plan

State Parks will implement a Construction Traffic Management Plan to ensure the safety of local traffic, pedestrians, and bicyclists. The plan will be prepared sufficiently in advance of project construction for adequate review, comment, and concurrence by the El Dorado County Department of Public Works. The plan will include advance public advisories, construction-period signage, flag personnel, and other special traffic-control actions. Specific measures contained in the plan include the following.

- Distribute or mail flyers to residents in the nearby Upper Truckee North and Meyers neighborhoods advising about upcoming project traffic prior to the initiation of construction.

- Place advisory signs along construction routes in advance of construction to alert traffic, pedestrian, and bicyclists about the upcoming construction traffic activity.

- Install construction area signage on designated haul routes to inform the public of the presence of trucks. These signs shall identify the construction truck crossing on the Sawmill Road bike trail.

- Provide flag personnel at the Sawmill Road crossing when truck activity at this location is heavy (i.e., more than 10 trucks per hour).

- Provide flag personnel at the Chilicothe Street/Cholula Street and San Bernardino Street/Cholula Street intersections to separate opposing vehicles, pedestrians, and cyclists when these large trucks use the route (i.e., one or more heavy trucks per day).

- Provide information to all truck drivers identifying haul routes, speed limits, location of flaggers, and any other pertinent public safety information.

- Monitor truck and traffic Conditions to identify traffic congestion, safety concerns regarding truck, vehicle, pedestrian and bicycle conflicts and to adjust the TCM as needed.

Because construction traffic controls implemented through the plan would minimize the potential conflicts, the impact of Alternative 2 would be less than significant after mitigation.

IMPACT 3.10-4 (Alt. 2)	Operational Impacts on the Local and Regional Circulation System. *The continuing operation of a golf course under Alternative 2 would attract traffic to Lake Valley SRA. However, the expected traffic volume would not be substantially different from the current traffic associated with the golf course. Therefore, this impact would be* ***less than significant.***

Alternative 2 would continue the operation of an 18-hole, regulation-length golf course at Lake Valley SRA. The reconfiguration implemented as a part of the alternative would require approximately four additional employees compared to the current golf course, which is estimated to involve up to three or four additional trips during the morning and afternoon peak hours each day. According to the economics study conducted for the EIR/EIS/EIS, the level of golf play would continue along current trends and would not change substantially, which is reasonable recognizing the continuation of a course with similar length as the current golf course (Appendix E). Golfer traffic constitutes the strong majority of total daily traffic when the course is open. Consequently, while a minor amount of additional operational employee traffic would occur, the total traffic generation of the golf course in Alternative 2 would not change substantially compared to existing conditions. As a result, LOS would remain the same and would remain within adopted standards. For these reasons, this impact of operational traffic on the local and regional circulation system would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.10-1 (Alt. 3)	Increased Construction Traffic on Local and Regional Circulation System. *Construction under Alternative 3 would add traffic to major roads in the project vicinity, but current LOS would not change appreciably. This impact would be* ***less than significant.***

As noted in Table 3.10-12, the maximum on-site construction employment under Alternative 3 is 28 persons. Thus, 28 inbound trips are expected to be generated in the a.m. peak hour and 28 outbound trips are expected in the p.m. peak hour. The total estimated amount of traffic associated with commuting by construction employees is similar to that forecast for Alternative 2.

Table 3.10-12
Traffic Characteristics of Alternative 3 Construction Phase

Description	Alternative 3
Total cubic yards of export over the life of the project	7,410
Total cubic yards of import over the life of the project	59,430
Total external truckloads over the life of the project @ 15 cu. yd./truck	4,474
Maximum annual truckloads in highest year	2,520
Duration of haul (varies)	24–108 days
Average daily truckloads	37
Highest hourly truck trips (10-hour day)	4 in, 4 out
Maximum on-site employment	28
Highest hourly employee traffic	a.m. 28 inbound, p.m. 28 outbound

Note: cu. yd./truck = cubic yards per truck
Source: Data provided by KD Anderson & Associates in 2009

The total number of truckloads is estimated to be 4,470 over the 3- to 4-year construction period of Alternative 3. The largest number of truckloads hauled in any given year would be 2,520 during the last year because Alternative 3 would include the most trail work of any of the alternatives and that trail work would all occur during the last year of construction. During that year, 42 truckloads per day could be hauled to or from the study area. The number of trucks per day under Alternatives 2 and 3 is similar because although the total number of trucks is higher under Alternative 2 than Alternative 3, the maximum trucks in one year is similar under both alternatives and the number of trucks per day is based on the construction year with the largest number of truckloads.

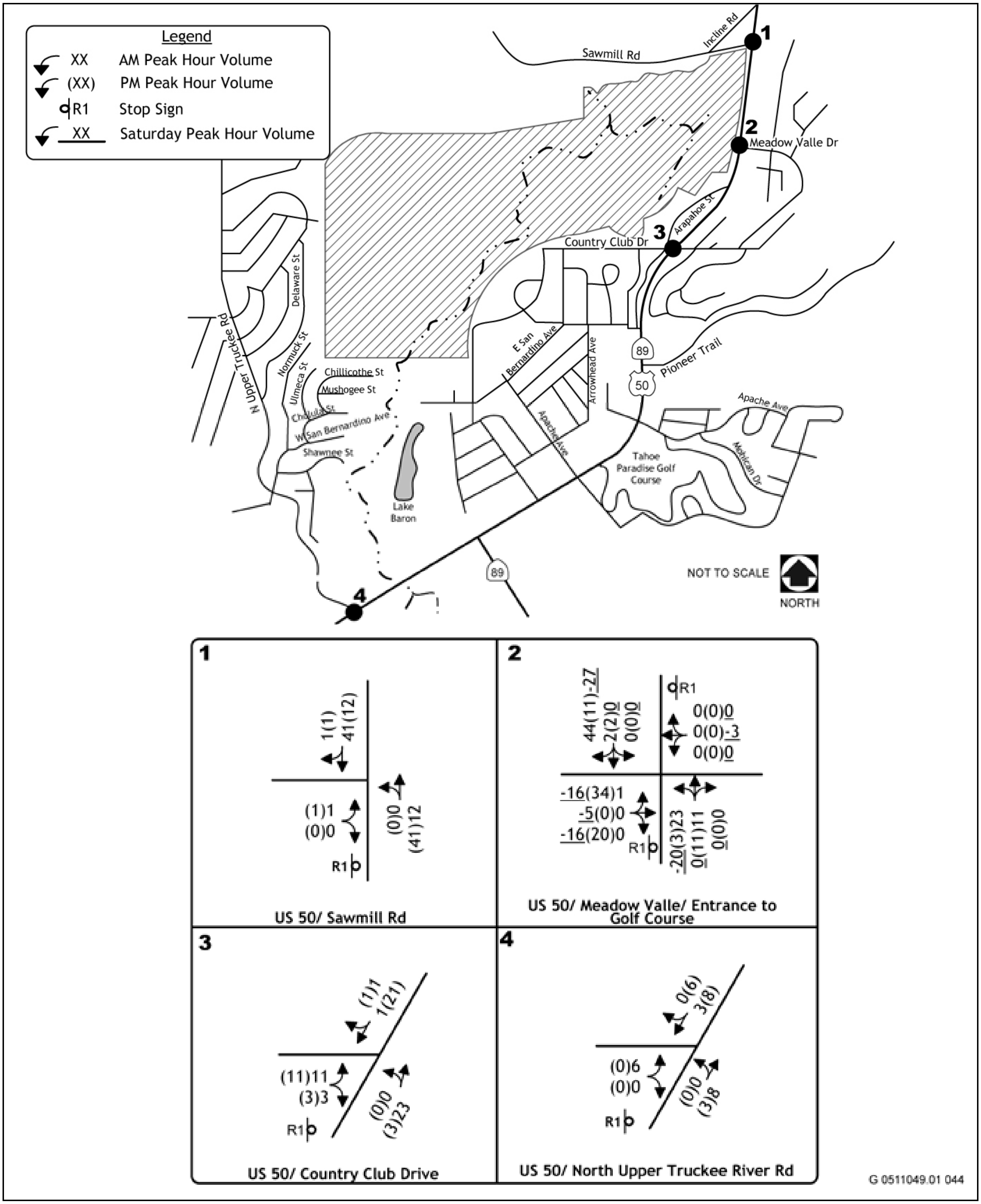
Table 3.10-13 summarizes peak-hour and daily trip generation for Alternative 3 on both a vehicle and PCE basis. Alternative 3 would add 16 PCEs to the local street system during both the a.m. and p.m. peak hours. This forecast is less than the projection for Alternative 2.

Table 3.10-13 Peak-Hour and Daily Trip Generation Estimates for Alternative 3 Construction Phase		
Description	In	Out
a.m. truck trips	4	4
a.m. employee trips	28	0
Total a.m. trips (vehicles)	32	4
Total a.m. PCEs	16	16
p.m. truck trips	4	4
p.m. employee trips	0	28
Total p.m. trips (vehicles)	4	32
Total p.m. PCEs	16	16
Total daily vehicles (employees, trucks, and misc. [10%])	**72**	**72**
Total daily PCEs	**148**	**148**
Source: Data provided by KD Anderson & Associates in 2009		

Localized truck traffic could result as materials are hauled to specific work zones under Alternative 3. Truck traffic destined for the main staging area would enter via the golf course entrance on U.S. 50. However, supplies and materials that would be delivered directly to various locations in the work area may enter via Sawmill Road, the golf course entrance, Country Club Drive, and the western Chilicothe Street, Cholula Street, and San Bernardino Street route to reach North Upper Truckee Road and U.S. 50. Although trucks would be noticeable on these routes at various times over the construction period, they would not represent an appreciable volume that affects traffic operations and congestion, as measured on a daily or peak-hour basis. Resulting construction-related traffic volumes under Alternative 3, expressed as project PCEs, are shown in Exhibit 3.10-5.

The amount of truck traffic on each haul route over the life of Alternative 3 has also been estimated. As noted in Table 3.10-14, approximately 83 percent of the 4,474 truckloads would enter via the golf course entrance and exit on Country Club Drive. Approximately 2 percent of the materials hauled to and from the study area under Alternative 3 would use the Chilicothe Street access. Compared to Alternative 2, Alternative 3 would add relatively little truck traffic to the Chilicothe Street–Cholula Street–San Bernardino Street to North Upper Truckee Road route and would add more traffic to the golf course entrance–Country Club Drive exit route.

Table 3.10-14 Truck Trip Assignment for Alternative 3 Construction Phase				
Access	Inbound	Percent of Total	Outbound	Percent of Total
Sawmill Road	258	6	258	6
Golf Course Entrance	3,715	83	409	9
Country Club Drive	409	9	3,715	83
Chilicothe Street	93	2	93	2
Total	**4,474**	**100**	**4,474**	**100**
Source: Data provided by KD Anderson & Associates in 2009				



Source: KD Anderson 2009

Construction-Related Traffic Volumes under Alternative 3, Expressed as Passenger Car Equivalents

Exhibit 3.10-5

Exhibit 3.10-6 illustrates existing traffic volumes plus construction-related traffic volumes associated with Alternative 3, again expressed in terms of project PCEs. Table 3.10-15 identifies peak-hour LOS at intersections in the project vicinity during the weekday a.m. and p.m. peak hour, respectively, under Alternative 3. No intersections are projected to operate with an overall or side-street LOS worse than LOS D. Levels of service would be similar to those under Alternative 2. At intersections controlled by side-street stop signs, adding project traffic would incrementally increase the length of delays experienced by motorists waiting to turn onto U.S. 50, but project traffic would not change acceptable LOS to unacceptable LOS at any location.

Implementation of Alternative 3 would add automobile and truck traffic to roads in the vicinity of the study area throughout the 3-year construction period. Project truck traffic (PCEs) is compared to existing 24-hour traffic volume counts in Table 3.10-16. Overall, the automobile and truck traffic resulting from implementation of Alternative 3 would result in total volumes that similar to or less than those associated with Alternative 2. As noted, the volume of traffic added to the Chilicothe Street–Cholula Street–San Bernardino Street route would be less under Alternative 3 than under Alternative 2 and project trips would not result in operating conditions in excess of adopted standards for LOS at intersections. Thus, this impact would be less than significant.

No mitigation is required.

IMPACT 3.10-2 (Alt. 3)	Contribution to Deterioration of Local Streets*. Construction under Alternative 3 would add truck traffic on local roads and across bicycle trails in the project vicinity. This traffic has the potential to contribute to the accelerated deterioration of pavement sections on streets and bicycle trails. This impact would be significant.*

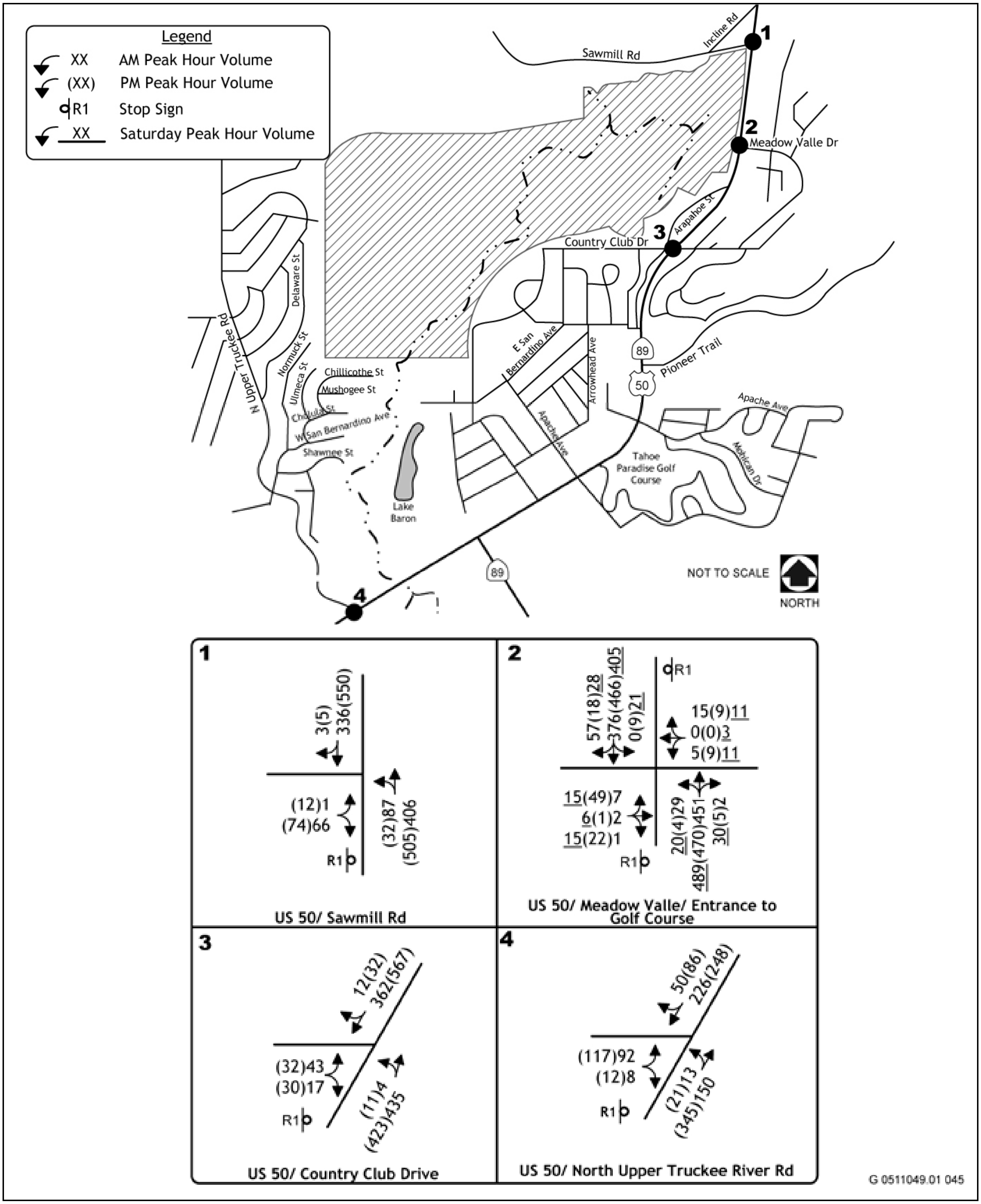
This contribution to pavement deterioration by Alternative 3 is similar to Alternative 2 (Impact 3.10-2) because large trucks could damage pavement along the northwest corner of the intersection of Chilicothe Street/Cholula Street and the northwest corner of the intersection of Cholula Street/San Bernardino Avenue, and along those local streets leading to U.S. 50. Although fewer trucks would use this route under Alternative 3 than under Alternative 2, reducing the severity of roadway deterioration compared to Alternative 2, the contribution would still be substantial.

Trucks using the Sawmill Road access would cross the bicycle trail planned on the south side of the road. Truck traffic could damage the trail. The amount of truck traffic across the trail under Alternative 3 would be similar to the amount under Alternative 2. This impact would be significant.

Mitigation Measure 3.10-2 (Alt. 3): Survey Pavement Conditions and Repair Damage.

This mitigation measure is identical to Mitigation Measure 3.10-2 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.10-2 (Alt. 3), Impact 3.10-2 (Alt. 3) would be less than significant.



Source: KD Anderson 2009

Traffic Volumes under Existing Conditions plus Alternative 3 Construction-Related Traffic, Expressed as Passenger Car Equivalents **Exhibit 3.10-6**

Table 3.10-15
Peak-Hour Levels of Service—Existing Conditions plus Alternative 3 Construction Traffic

Location	Control	Weekday Peak-Hour Levels of Service							
		a.m. Peak Hour (7:00 to 9:00 a.m.)				a.m. Peak Hour (4:00 to 6:00 p.m.			
		Existing		Existing plus Alternative 3		Existing		Existing plus Alternative 3	
		Average Delay (sec/veh)	LOS	Average Delay (sec/vehicle)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/vehicle)	LOS
U.S. 50/Sawmill Road									
(overall)	EB Stop	(1.7)	(A)	(1.6)	(A)	(1.4)	(A)	(1.4)	(A)
Northbound left turn		8.2	A	8.3	A	8.8	A	8.8	A
Eastbound left+right turn		10.6	B	11.1	B	15.6	C	16.3	C
U.S. 50/Golf Course/Meadow Vale Drive	EB/WB Stop								
(overall)		(0.6)	(A)	(0.8)	(A)	(0.9)	(A)	(2.3)	(A)
Northbound left turn		8.2	A	8.4	A	8.4	A	8.5	A
Southbound left turn		–	–	–	–	8.4	A	8.5	A
Eastbound left+through+right turn		18.7	C	21.2	C	22.8	C	26.7	D
Westbound left+through+right turn		13.5	B	14.2	B	17.7	C	18.9	C
U.S. 50/Country Club Drive									
(overall)	EB Stop	(0.9)	(A)	(1.2)	(A)	(0.9)	(A)	(1.2)	(A)
Northbound left turn		8.1	A	8.1	A	8.8	A	8.9	A
Eastbound left+right turn		15.7	C	16.8	C	17.8	C	20.2	C
U.S. 50/North Upper Truckee Road									
(overall)	EB Stop	(2.5)	(A)	(2.7)	(A)	(3.1)	(A)	(3.1)	(A)
Northbound left turn		7.9	A	7.9	A	8.0	A	8.1	A
Eastbound left+through+right turn		12.6	B	12.9	B	18.5	C	18.9	C

Notes: EB = eastbound; LOS = level of service; sec/veh = seconds per vehicle; U.S. 50 = U.S. Highway 50; WB = westbound
Source: Data provided by KD Anderson & Associates in 2009

Table 3.10-16
Daily Traffic Volumes—Existing Conditions plus Alternative 3 Construction Traffic

Location			Weekday Daily Volume					
			July			Peak Month		
Road/Street	From	To	Existing	Project Only	Total	Existing	Project Only (PCEs)	Total
U.S. 50	North Upper Truckee Road	SR 89				13,400	88	13,488
	SR 89	Pioneer Trail				16,800	108	16,908
	Pioneer Trail	Golf Course				17,200	191	17,391
	Golf Course	Sawmill Road				17,200	294	17,494
	Sawmill Road	H Street				16,000	304	16,306
Sawmill Road	Incline Road	U.S. 50	1,184	14	1,198	1,200	14	1,214
Country Club Drive	Arapahoe	U.S. 50	669	137	806	670	137	707
North Upper Truckee Road	U.S. 50	Otomites Street	1,923	20	1,942	1,950	20	1,970
San Bernardino Avenue	North Upper Truckee Road	Cholula Street	494	12	506	500	12	512

Notes: PCEs = Passenger Car Equivalents; SR = State Route; U.S. 50 = U.S. Highway 50
Source: Data provided by KD Anderson & Associates in 2009

IMPACT 3.10-3 (Alt. 3) **Potential for Conflicts between Construction Traffic and Local Traffic, Pedestrians, and Bicycles.** *Construction under Alternative 3 would add short-term truck traffic on local roads in the project vicinity, and this traffic has the potential to create conflicts with local traffic, pedestrians, and bicyclists. This impact would be* ***significant.***

This impact is similar to Impact 3.10-3 (Alt. 2) because truck traffic could conflict with local traffic, pedestrians, or bicycles at the Chilicothe Street/Cholula Street and San Bernardino Street/Cholula Street intersections and along local streets used for construction access when large trucks use the route. Because fewer trucks are expected on this route under Alternative 3 than under Alternative 2, this impact would be less severe under Alternative 3 compared to Alternative 2, but it would still be substantial. As under Alternative 2, conflicts could occur at Sawmill Road where trucks would cross the new bicycle trail proposed along the south side of Sawmill Road, creating the possibility of conflicts between trucks and cyclists. The number of trucks crossing the trail under Alternative 3 is similar to that occurring under Alternative 2. This impact would be significant.

Mitigation Measure 3.10-3 (Alt. 3): Construction Traffic Management Plan

This mitigation measure is identical to Mitigation Measure 3.10-3 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.10-3 (Alt. 3), Impact 3.10-3 (Alt. 3) would be less than significant.

IMPACT 3.10-4 (Alt. 3) **Operational Impacts on the Local and Regional Circulation System**. *The continuing operation of a golf course under Alternative 3 would attract traffic to Lake Valley SRA. However, this traffic volume would be no greater than the current traffic associated with the golf course, and in fact could be less.* ***No impact*** *would occur.*

Alternative 3 would continue to generate operational traffic with the reduced-play golf course, but a reduced course would accommodate fewer golfers and the volume of traffic associated with travel to and from the course could be less than existing conditions. The golf course access location would not change, but if the volume of traffic at the access on U.S. 50 were reduced, the length of delays at this location would be less than those identified under Alternative 1 or Alternative 2. Because traffic operations would be better than the current condition, the operational, post-project impact under Alternative 3 would be less than existing conditions. Therefore, no impact would occur.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.10-1 (Alt. 4) **Increased Construction Traffic on Local and Regional Circulation System.** *Construction under Alternative 4 would add traffic to major roads in the project vicinity, but current operating LOS would not change appreciably. This impact would be* ***less than significant.***

As noted in Table 3.10-17, the maximum on-site construction employment under Alternative 4 is 42 persons. Thus 42 inbound trips are expected to be generated in the a.m. peak hour and 42 outbound trips are expected in the p.m. peak hour. This forecast is similar to the estimate for Alternative 2.

The total number of truckloads is 6,868 over the 2- to 3-year construction life of Alternative 4. Because the duration of construction could be only 2 years, the largest number of truckloads that would be hauled in a single year is 4,050 during the second year. During that year, 49 truckloads per day could be hauled to or from the study area. Although the number of trucks per day under Alternative 4 is only slightly higher than under other alternatives, the total number of truckloads is the highest under this alternative because the boulder material being imported for stabilization of the river is more than for geomorphic restoration. The trucks per day values are similar because of the materials being imported for golf course reconfiguration under Alternative 2 (e.g., asphalt and sod).

Table 3.10-17
Traffic Characteristics of Alternative 4 Construction Phase

Description	Alternative 4
Total cubic yards of export over the life of the project	27,720
Total cubic yards of import over the life of the project	76,640
Total external truckloads over the life of the project @ 15 cu. yd./truck	6,868
Maximum annual truckloads in highest year	4,050
Duration of haul (varies)	24–108 days
Average daily truckloads	49
Highest hourly truck trips (10-hour day)	5 in, 5 out
Maximum on-site employment	42
Highest hourly employee traffic	a.m. 42 inbound, p.m. 42 outbound

Note: cu. yd./truck = cubic yards per truck
Source: Data provided by KD Anderson & Associates in 2009

Table 3.10-18 summarizes peak-hour and daily trip generation for Alternative 4 on both a vehicle and PCE basis. Alternative 4 would add 94 PCEs during the a.m. and p.m. peak hours. This forecast is similar to but slightly higher than the estimate for Alternative 2 or Alternative 3.

Table 3.10-18
Peak-Hour and Daily Trip Generation Estimates for Alternative 4 Construction Phase

	Alternative 4	
Description	In	Out
a.m. truck trips	5	5
a.m. employee trips	42	0
Total a.m. trips (vehicles)	47	5
Total a.m. PCEs	20	20
p.m. truck trips	5	5
p.m. employee trips	0	42
Total p.m. trips (vehicles)	5	47
Total p.m. PCEs	20	20
Total daily vehicles (employees, trucks, and misc. [10%])	100	100
Total daily PCEs	196	196

Note: PCE = Passenger Car Equivalent
Source: Data provided by KD Anderson & Associates in 2009

Localized truck traffic could result as materials are hauled to specific work zones under Alternative 4. Truck traffic destined for the main staging area would enter via the golf course entrance on U.S. 50. However, supplies and materials that would be delivered directly to various locations in the work area may enter via Sawmill Road, the golf course entrance, Country Club Drive, and the western Chilicothe Street, Cholula Street, and San Bernardino Street route to reach North Upper Truckee Road and U.S. 50. Although trucks would be noticeable on these routes at various times over the construction period, they would not represent an appreciable volume that affects traffic operations and congestion, as measured on a daily or peak-hour basis. Resulting construction-related traffic volumes under Alternative 4, expressed as project PCEs, are shown in Exhibit 3.10-7.

The amount of truck traffic on each haul route over the life of Alternative 4 has also been estimated. As noted in Table 3.10-19, approximately 71 percent of the 6,868 truckloads would enter via the golf course entrance and exit on Country Club Drive. Approximately 13 percent of the materials hauled to and from the site under Alternative 4 would use the Chilicothe Street access. The amount of truck traffic using the Chilicothe Street access would be less than forecast under Alternative 2, but more than under Alternative 3. The number of trucks using Country Club Drive would be higher under Alternative 4 than under Alternative 2 or Alternative 3.

Table 3.10-19
Truck Trip Assignment for Alternative 4 Construction Phase

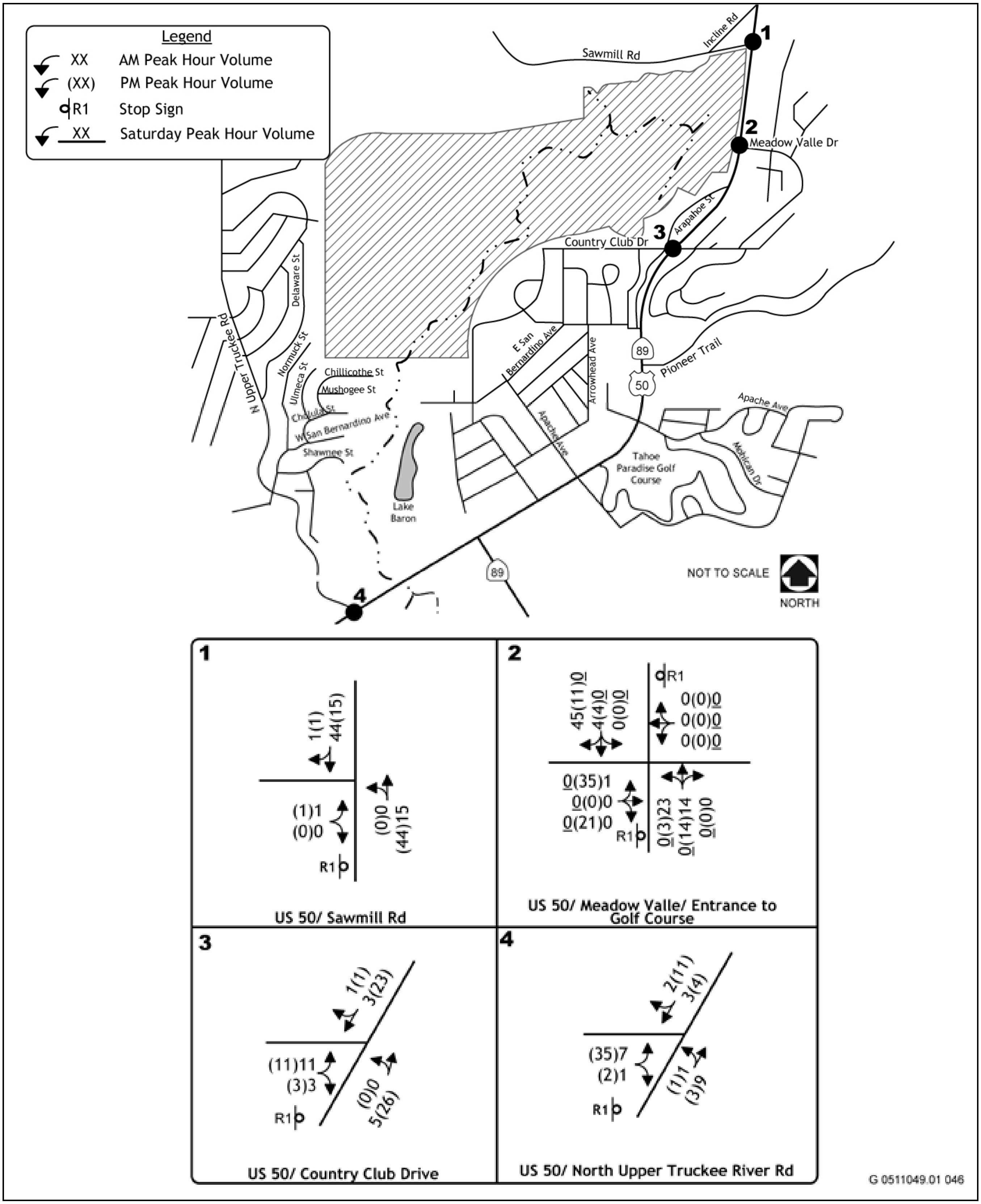
Access	Inbound	Percent of total	Outbound	Percent of total
Sawmill Road	644	9	644	9
Golf Course Entrance	4,847	71	483	7
Country Club Drive	483	7	4,847	71
Chilicothe Street	894	13	894	13
Total	**6,868**	**100**	**5,760**	**100**

Source: Data provided by KD Anderson & Associates in 2009

Exhibit 3.10-8 illustrates existing traffic volumes plus construction-related traffic volumes associated with Alternative 4, again expressed in terms of project PCEs. Table 3.10-20 identifies peak-hour LOS at intersections in the project vicinity during the a.m. and p.m. peak hour, respectively, under Alternative 4. Although the volume of traffic through study intersections may increase, no intersections are projected to operate with an overall or side-street LOS worse than LOS D. At intersections controlled by side-street stop signs, adding project traffic would incrementally increase the length of delays experienced by motorists waiting to turn onto U.S. 50, but project traffic would not change acceptable LOS to unacceptable conditions. Levels of service under Alternative 4 are similar to that forecast for Alternative 2.

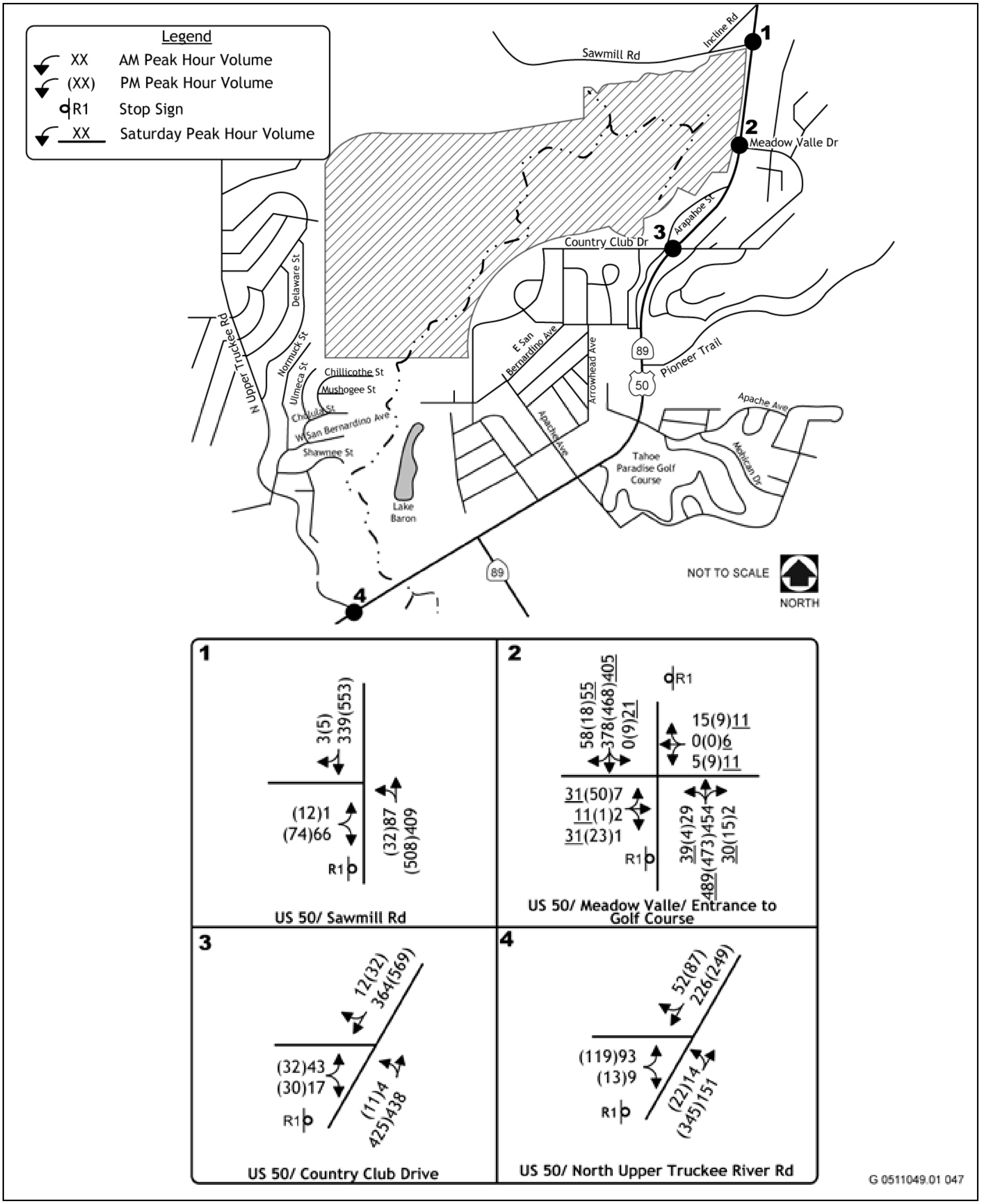
Development of Alternative 4 would add construction truck and employee traffic to roads in the project vicinity throughout the construction period. Alternative 4 truck traffic is compared to existing 24-hour traffic volume counts in Table 3.10-21. Overall, the automobile and truck traffic resulting from implementation of Alternative 4 would result in total volumes that are similar to those accompanying Alternative 2 and Alternative 3. Alternative 4 trips would not result in operating conditions in excess of adopted standards for LOS at intersections. Thus, this impact would be less than significant.

No mitigation is required.



Source: KD Anderson 2009

Construction-Related Traffic Volumes under Alternative 4, Expressed as Passenger Car Equivalents **Exhibit 3.10-7**



Source: KD Anderson 2009

Traffic Volumes under Existing Conditions plus Alternative 4 Construction-Related Traffic, Expressed as Passenger Car Equivalents **Exhibit 3.10-8**

Table 3.10-20
Peak-Hour Levels of Service—Existing Conditions plus Alternative 4 Construction Traffic

		Weekday Peak-Hour Levels of Service							
		a.m. Peak Hour (7:00 to 9:00 a.m.)				a.m. Peak Hour (4:00 to 6:00 p.m.)			
		Existing		Existing plus Alternative 4		Existing		Existing plus Alternative 4	
Location	Control	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
U.S. 50/Sawmill Road									
(overall)	EB Stop	(1.7)	(A)	(1.6)	(A)	(1.4)	(A)	(1.4)	(A)
Northbound left turn		8.2	A	8.3	A	8.8	A	8.8	A
Eastbound left+right turn		10.6	B	11.1	B	15.6	C	16.3	C
U.S. 50/Golf Course/Meadow Vale Drive									
(overall)	EB/WB Stop	(0.6)	(A)	(0.8)	(A)	(0.9)	(A)	(2.3)	(A)
Northbound left turn		8.2	A	8.4	A	8.4	A	8.5	A
Southbound left turn		–	–	–	–	8.4	A	8.5	A
Eastbound left+through+right turn		18.7	C	21.4	C	22.8	C	27.2	D
Westbound left+through+right turn		13.5	B	14.2	B	17.7	C	19.0	C
U.S. 50/Country Club Drive									
(overall)	EB Stop	(0.9)	(A)	(1.2)	(A)	(0.9)	(A)	(1.2)	(A)
Northbound left turn		8.1	A	8.1	A	8.8	A	8.9	A
Eastbound left+right turn		15.7	C	16.9	C	17.8	C	20.3	C
U.S. 50/North Upper Truckee Road									
(overall)	EB Stop	(2.5)	(A)	(2.6)	(A)	(3.1)	(A)	(3.2)	(A)
Northbound left turn		7.9	A	7.9	A	8.0	A	8.1	A
Eastbound left+through+right turn		12.6	B	13.0	B	18.5	C	19.1	C

Notes: EB = eastbound; LOS = level of service; sec/veh = seconds per vehicle; U.S. 50 = U.S. Highway 50; WB = westbound
Source: Data provided by KD Anderson & Associates in 2009

Table 3.10-21
Daily Traffic Volumes—Existing Conditions plus Alternative 4 Construction Traffic

Location			Weekday Daily Volume					
			July			Peak Month		
Road/Street	From	To	Existing	Project Only	Total	Existing	Project Only (PCEs)	Total
U.S. 50	North Upper Truckee Road	SR 89				13,400	136	13,536
	SR 89	Pioneer Trail				16,800	158	16,958
	Pioneer Trail	Golf Course				17,200	249	17,449
	Golf Course	Sawmill Road				17,200	364	17,564
	Sawmill Road	H Street				16,000	384	16,384
Sawmill Road	Incline Road	U.S. 50	1,184	36	1,220	1,200	36	1,236
Country Club Drive	Arapahoe	U.S. 50	669	153	822	670	153	823
North Upper Truckee Road	U.S. 50	Otomites Street	1,923	64	1,987	1,950	64	2,014
San Bernardino Avenue	North Upper Truckee Road	Cholula Street	494	12	506	500	12	512

Notes: PCEs = Passenger Car Equivalents; SR = State Route; U.S. 50 = U.S. Highway 50
Source: Data provided by KD Anderson & Associates in 2009

IMPACT 3.10-2 (Alt. 4) **Contribution to Deterioration of Local Streets***. Construction under Alternative 4 would add truck traffic on local roads and across bicycle trails in the project vicinity. This traffic has the potential to contribute to the accelerated deterioration of pavement sections on street and bicycle trails. This impact would be **significant**.*

This contribution to pavement deterioration by Alternative 4 is similar to Alternative 2 (Impact 3.10-2) because large trucks could damage pavement along the northwest corner of the intersection of Chilicothe Street/Cholula Street and the northwest corner of the intersection of Cholula Street/San Bernardino Avenue, and along those local streets leading to U.S. 50. Although, fewer trucks would use this route under Alternative 4 than under Alternative 2, the number of trucks would be greater than Alternative 3 and would be substantial.

Trucks using the Sawmill Road access would cross the bicycle trail planned on the south side of the road. Truck traffic could damage the trail. The number of trucks crossing the trail under Alternative 4 would be greater than the number projected under Alternative 2 or Alternative 3. This impact would be significant.

Mitigation Measure 3.10-2 (Alt. 4): Survey Pavement Conditions and Repair Damage.

This mitigation measure is identical to Mitigation Measure 3.10-2 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.10-2 (Alt. 4), Impact 3.10-2 (Alt. 4) would be less than significant.

IMPACT 3.10-3 (Alt. 4) **Potential for Conflicts between Construction Traffic and Local Traffic, Pedestrians, and Bicycles***. Construction under Alternative 4 would add short-term truck traffic on local roads in the project vicinity. This traffic has the potential to create conflicts with local traffic, pedestrians, and bicyclists. This impact would be **significant**.*

This impact is similar to Impact 3.10-3 (Alt. 2) because truck traffic could conflict with local traffic, pedestrians, or bicycles at the Chilicothe Street/Cholula Street and San Bernardino Street/Cholula Street intersections and along local streets used for construction access when large trucks use the route. The number of trucks expected on this route under Alternative 4 is lower than the number projected for Alternative 2 and more than under Alternative 3. As under Alternative 2 and 3, Alternative 4 trucks would cross the new bicycle trail proposed along the south side of Sawmill Road, creating the possibility of conflicts between trucks and cyclists. More trucks would use Sawmill Road under Alternative 4 than under Alternative 2 and 3. The number of trucks crossing the bicycle trail under Alternative 4 would be similar to the number of trucks under Alternative 2. This impact would be significant.

As with Alternative 2, the unpaved parking area would be paved under Alternative 4 to create an additional 89 parking spaces. The issues associated with use of this lot would be similar to those noted under Alternative 2.

Mitigation Measure 3.10-3 (Alt. 4): Construction Traffic Management Plan

This measure is identical to Mitigation Measure 3.10-3 (Alt. 2).

For the same reasons noted for Mitigation Measure 3.10-3 (Alt. 2), with implementation of Mitigation Measure 3.10-3 (Alt 4) this impact is less than significant.

IMPACT 3.10-4 (Alt. 4) **Operational Impacts on the Local and Regional Circulation System***. The continuing operation of a golf course under Alternative 4 would attract traffic to Lake Valley SRA. However, because this traffic volume is no greater than the current traffic associated with the existing use of the golf course, **no impact** would occur.*

Construction under Alternative 4 would not generate traffic continuing beyond the construction period. In addition, although Alternative 4 would perpetuate regular activity at the golf course, the access location would not change and the volume of traffic at the site after construction would not be different from the current volume. For these reasons, the LOS occurring under regular conditions after completion of the project would be the same as those occurring under Alternative 1. No impact would occur.

No mitigation measures are required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.10-1 (Alt. 5)	Increased Construction Traffic on the Local and Regional Circulation System. *Construction under Alternative 5 would add traffic to major roads in the project vicinity, but current LOS would not change appreciably. This impact would be* ***less than significant.***

As noted in Table 3.10-22, the maximum on-site construction employment under Alternative 5 is 20 persons. Thus 20 inbound trips are expected to be generated in the a.m. peak hour and 20 outbound trips are expected in the p.m. peak hour.

Table 3.10-22
Traffic Characteristics of Alternative 5 Construction Phase

Description	Alternative 5
Total cubic yards of export over the life of the project	18,760
Total cubic yards of import over the life of the project	36,600
Total external truckloads over the life of the project @ 15 cu. yd./truck	3,712
Maximum annual truckloads in highest year	1,780
Duration of haul (varies)	24–108 days
Average daily truckloads	22
Highest hourly truck trips (10-hour day)	5 in, 5 out
Maximum on-site employment	20
Highest hourly employee traffic	a.m. 20 inbound, p.m. 20 outbound

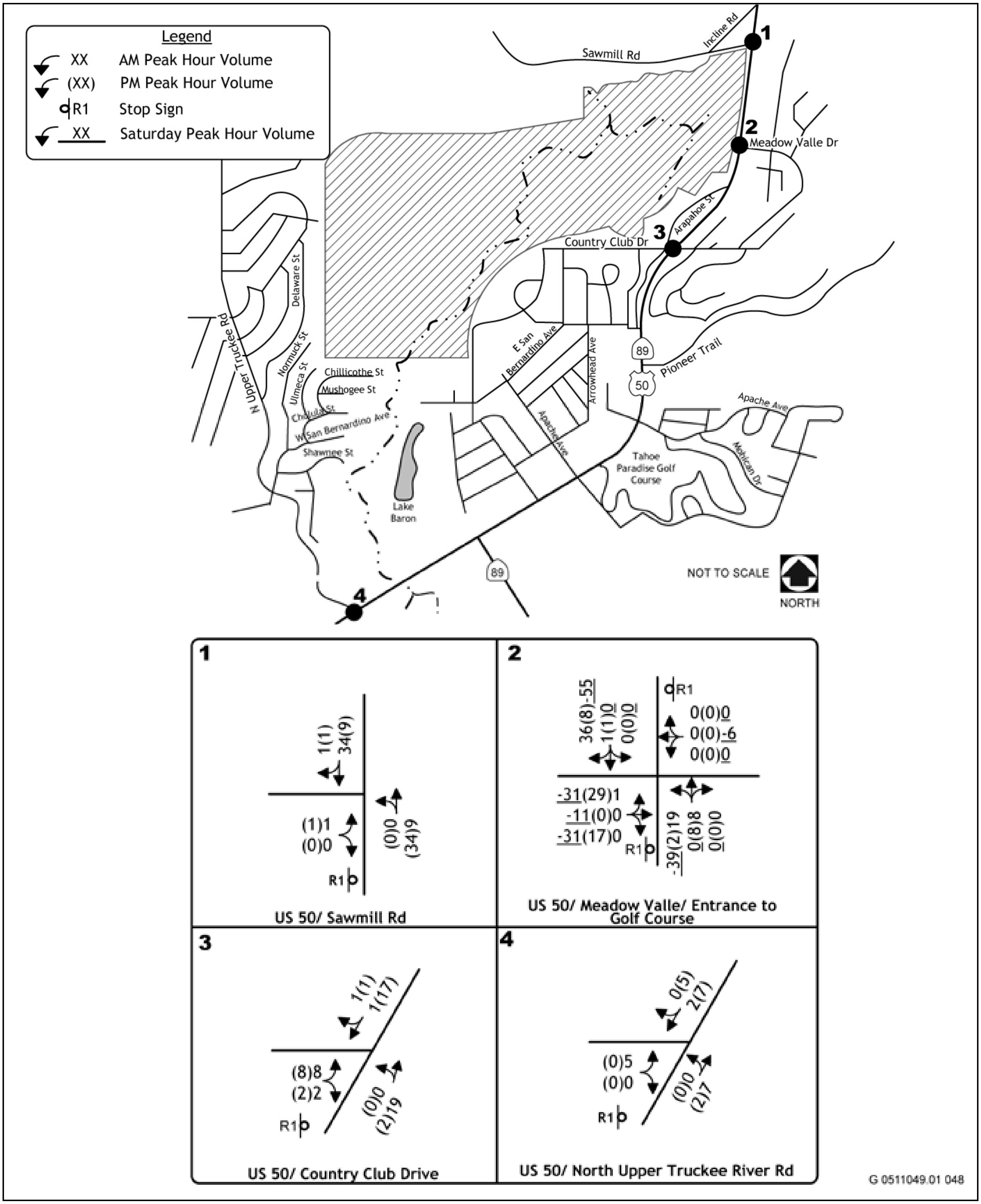
Note: cu. yd./truck = cubic yards per truck
Source: Data provided by KD Anderson & Associates in 2009

The total number of truckloads is 3,712 over the life of Alternative 5. This estimate of truckloads is lower than that made for Alternative 2, 3, or 4. Construction would be spread over 3 years, and the largest number of truckloads would be hauled in the first year (1,780). During that year, 22 truckloads per day could be hauled to or from the site, and this forecast is lower than Alternative 2, 3, or 4.

Table 3.10-23 summarizes peak-hour and daily trip generation for Alternative 5 on both a vehicle and PCE basis. Alternative 5 would add 69 PCEs during the a.m. and p.m. peak hours. This estimate is lower than the estimate under Alternative 2, 3, or 4.

As discussed under Alternative 2, localized truck traffic could result as materials are hauled to specific work zones under Alternative 5. Although trucks would be noticeable on various routes at different times over the construction period, they would not represent an appreciable volume that affects traffic operations, as measured on a daily or peak-hour basis. Resulting construction-related traffic volumes under Alternative 5, expressed as project PCEs, are shown in Exhibit 3.10-9.

The amount of truck traffic on each haul route over the life of Alternative 5 has also been estimated. As noted in Table 3.10-24, approximately 80 percent of the 3,712 truckloads would enter via the golf course entrance and exit on Country Club Drive. Approximately 2 percent of the materials hauled to and from the site under Alternative 5 would use the Chilicothe Street access. This value is smaller than the forecast for that road under Alternative 2 and Alternative 4, but similar to the use under Alternative 3.



Source: KD Anderson 2009

Construction-Related Traffic Volumes under Alternative 5, Expressed as Passenger Car Equivalents **Exhibit 3.10-9**

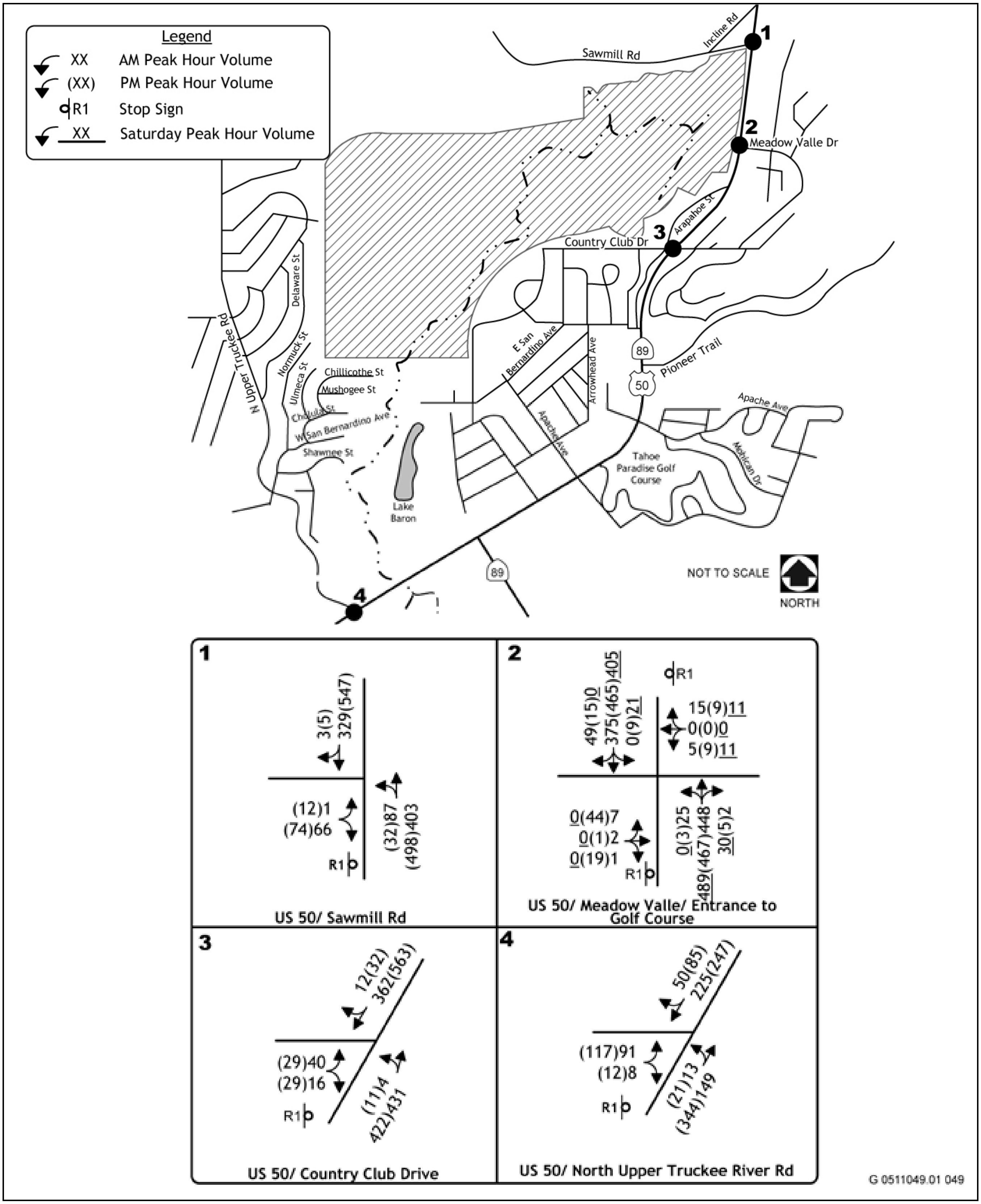
Table 3.10-23 Peak-Hour and Daily Trip Generation Estimates for Alternative 5 Construction Phase		
Description	Alternative 5	
	In	Out
a.m. truck trips	5	5
a.m. employee trips	20	0
Total a.m. trips (vehicles)	23	5
Total a.m. PCEs	20	20
p.m. truck trips	5	5
p.m. employee trips	0	20
Total p.m. trips (vehicles)	5	23
Total p.m. PCEs	20	20
Total daily vehicles (employees, trucks, and misc. [10%])	**46**	**46**
Total daily PCEs	**88**	**88**
Note: PCE = Passenger Car Equivalent Source: Data provided by KD Anderson & Associates in 2009		

Table 3.10-24 Truck Trip Assignment for Alternative 5 Construction Phase				
Access	Inbound	Percent of Total	Outbound	Percent of Total
Sawmill Road	258	7	258	7
Golf Course Entrance	2,952	80	409	11
Country Club Drive	409	11	2,952	80
Chilicothe Street	93	2	93	2
Total	**3,712**	**100**	**3,712**	**100**
Source: Data provided by KD Anderson & Associates in 2009				

Exhibit 3.10-10 illustrates existing traffic volumes plus construction-related traffic volumes associated with Alternative 5, again expressed in terms of project PCEs. Table 3.10-25 identifies peak-hour LOS at intersections in the project vicinity during the a.m. and p.m. peak hour, respectively, under Alternative 5. As indicated, no intersections are projected to operate with an overall or side-street LOS worse than LOS D. At intersections controlled by side-street stop signs, adding project traffic would incrementally increase the length of delays experienced by motorists waiting to turn onto U.S. 50, but project traffic would not change acceptable LOS to unacceptable conditions. Levels of service under Alternative 5 would be similar to those occurring under Alternatives 2, 3, and 4.

Implementation of Alternative 5 would add truck and automobile traffic to roads in the vicinity of the study area throughout the construction period. Project truck traffic is compared to existing 24-hour traffic volume counts in Table 3.10-26. Overall, the automobile and truck traffic resulting from construction period of Alternative 5 would result in total volumes that are similar to those associated with Alternative 2, but less than under Alternatives 3 and 4. Project trips would not result in operating conditions in excess of adopted standards for LOS at intersections. Thus, this impact would be less than significant.

No mitigation is required.



Source: KD Anderson 2009

Traffic Volumes under Existing Conditions plus Alternative 5 Construction-Related Traffic, Expressed as Passenger Car Equivalents **Exhibit 3.10-10**

Table 3.10-25
Peak-Hour Levels of Service—Existing Conditions plus Alternative 5 Construction Traffic

Location	Control	Weekday Peak-Hour Levels of Service							
		a.m. Peak Hour (7:00 to 9:00 a.m.)				a.m. Peak Hour (4:00 to 6:00 p.m.)			
		Existing		Existing plus Alternative 5		Existing		Existing plus Alternative 5	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
U.S. 50/Sawmill Road	EB Stop								
(overall)		(1.7)	(A)	(1.6)	(A)	(1.4)	(A)	(1.4)	(A)
Northbound left turn		8.2	A	8.3	A	8.8	A	8.8	A
Eastbound left+right turn		10.6	B	11.0	B	15.6	C	16.2	C
U.S. 50/Golf Course/Meadow Vale Drive									
(overall)	EB/WB Stop	(0.6)	(A)	(0.8)	(A)	(0.9)	(A)	(2.0)	(A)
Northbound left turn		8.2	A	8.4	A	8.4	A	8.5	A
Southbound left turn		–	–	–	–	8.4	A	8.5	A
Eastbound left+through+right turn		18.7	C	20.7	C	22.8	C	25.5	D
Westbound left+through+right turn		13.5	B	14.0	B	17.7	C	18.6	C
U.S. 50/Country Club Drive									
(overall)	EB Stop	(0.9)	(A)	(1.1)	(A)	(0.9)	(A)	(1.1)	(A)
Northbound left turn		8.1	A	8.1	A	8.8	A	8.9	A
Eastbound left+right turn		15.7	C	16.5	C	17.8	C	19.6	C
U.S. 50/North Upper Truckee Road									
(overall)	EB Stop	(2.5)	(A)	(2.6)	(A)	(3.1)	(A)	(3.1)	(A)
Northbound left turn		7.9	A	7.9	A	8.0	A	8.1	A
Eastbound left+through+right turn		12.6	B	12.8	B	18.5	C	18.8	C

Notes: EB = eastbound; LOS = level of service; sec/veh = seconds per vehicle; U.S. 50 = U.S. Highway 50
Source: Data provided by KD Anderson & Associates in 2009

Table 3.10-26
Daily Traffic Volumes—Existing Conditions plus Alternative 5 Construction Traffic

Location			Weekday Daily Volume					
			July			Peak Month		
Road/Street	From	To	Existing	Project Only	Total	Existing	Project Only (PCEs)	Total
U.S. 50	North Upper Truckee Road	SR 89				13,400	58	13,458
	SR 89	Pioneer Trail				16,800	76	16,876
	Pioneer Trail	Golf Course				17,200	124	17,324
	Golf Course	Sawmill Road				17,200	190	17,380
	Sawmill Road	H Street				16,000	198	16,198
Sawmill Road	Incline Road	U.S. 50	1,184	12	1,196	1,200	12	1,212
Country Club Drive	Arapahoe	U.S. 50	669	184	853	670	184	854
North Upper Truckee Road	U.S. 50	Otomites Street	1,923	14	1,937	1,950	14	1,964
San Bernardino Avenue	North Upper Truckee Road	Cholula Street	494	4	498	500	4	504

Notes: PCEs = Passenger Car Equivalents; SR = State Route; U.S. 50 = U.S. Highway 50
Source: Data provided by KD Anderson & Associates in 2009

IMPACT 3.10-2 (Alt. 5)	**Contribution to Deterioration of Local Streets**. *Construction under Alternative 5 would add truck traffic on local roads and across bicycle trails in the project vicinity. This traffic has the potential to contribute to the accelerated deterioration of pavement sections on streets and bicycle trails. This impact would be* ***significant.***

This contribution to pavement deterioration by Alternative 5 is similar to Alternative 2 (Impact 3.10-2), because large trucks could damage pavement along the northwest corner of the intersection of Chilicothe Street/Cholula Street and the northwest corner of the intersection of Cholula Street/San Bernardino Avenue, and along those local streets leading to U.S. 50. Fewer trucks would use this route under Alternative 5 than under Alternative 2, but the route would be used by more trucks than under Alternative 3 and the number would be substantial.

Trucks using the Sawmill Road access would cross the bicycle trail planned on the south side of the road. Truck traffic could damage the trail. The number of trucks crossing the trail under Alternative 5 is the same as under Alternative 3 and less than projected under Alternative 2 or Alternative 4. This impact would be significant.

Mitigation Measure 3.10-2 (Alt. 5): Survey Pavement Conditions and Repair Damage.

This mitigation measure is identical to Mitigation Measure 3.10-2 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.10-2 (Alt. 3), Impact 3.10-2 (Alt. 3) would be less than significant.

IMPACT 3.10-3 (Alt. 5)	**Potential for Conflicts between Construction Traffic and Local Traffic, Pedestrians, and Bicycles***. Construction under Alternative 5 would add short-term truck traffic on local roads in the project vicinity. This traffic has the potential to create conflicts with local traffic, pedestrians, and bicyclists. This impact would be* ***significant.***

This impact is similar to Impact 3.10-3 (Alt. 3) because truck traffic could conflict with local traffic, pedestrians or bicycles at the Chilicothe Street/Cholula Street and San Bernardino Street/Cholula Street intersections and along local streets used for construction access when large trucks use the route. Because fewer trucks are expected on this route under Alternative 5 than under Alternative 2 and Alternative 4, this impact would be less severe under Alternative 5. As under Alternative 3, conflicts could occur at Sawmill Road where trucks would cross the new bicycle trail proposed along the south side of Sawmill Road, creating the possibility of conflicts between trucks and cyclists. The number of trucks crossing the trail under Alternative 5 is similar the number of trucks under Alternatives 2 and 3, but less than under Alternative 4.

Mitigation Measure 3.10-3 (Alt. 5): Construction Traffic Management Plan

This mitigation measure is identical to Mitigation Measure 3.10-3 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.10-3 (Alt. 5), Impact 3.10-3 (Alt. 5) would be less than significant.

IMPACT 3.10-4 (Alt. 5)	**Operational Impacts on the Local and Regional Circulation System**. *The site would no longer generate the traffic accompanying the regular operation of a golf course under Alternative 5, and resulting traffic volumes on the regional circulation system would be less than under existing conditions. Resulting operating LOS for regular traffic would be the same as or better than current LOS.* ***No impact*** *would occur.*

Alternative 5 would eliminate the regular operation of the 18-hole, regulation-length golf course and restore the golf course site to natural meadow and riparian habitat. Prior to elimination, if feasible, the State may operate a short golf course or a 9-hole course on an interim basis until land use planning for long-term outdoor recreation uses and/or natural habitat is completed. The volume of traffic at the site after construction would be less than current volume because of either the absence of the golf course, or the extended interim use as a smaller golf course, and LOS would be the same or better than current LOS. Therefore, no impact would occur.

No mitigation is required.

3.11 AIR QUALITY

This section describes the study area's existing air quality conditions and applicable air quality regulations, and analyzes potential short-term and long-term air quality impacts that could result from implementation of Alternatives 1–5. Mitigation measures are recommended as necessary to reduce potentially significant adverse impacts on air quality. Consistency with TRPA goals and policies is presented in Section 3.2, Land Use," Table 3.2-1. Cumulative air quality impacts are discussed in Section 3.16, "Cumulative Impacts." The project effects on thresholds are described in Chapter 4, Section 4.6 "Consequences for Environmental Threshold Carrying Capacities."

3.11.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Air quality within the El Dorado County portion of the Lake Tahoe Air Basin (LTAB) is regulated by the EPA, California Air Resources Board (ARB), TRPA, and El Dorado County Air Quality Management District (EDCAQMD). Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, State and local regulations may be more stringent.

Federal

EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

Criteria Air Pollutants

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 3.11-1, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State implementation plan (SIP). The Federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin. It is important to note that because the study area would not be located in a nonattainment or maintenance area with respect to any of the NAAQS and because the project would not require Federal funding, a CAA conformity determination is not required for the project.

Toxic Air Contaminants/Hazardous Air Pollutants

Air quality regulations also focus on toxic air contaminants (TACs), or in Federal parlance hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be

Table 3.11-1
Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California [a,b]	National [c]	
				Primary [b,d]	Secondary [b,e]
Ozone	1-hour	0.08 ppm	0.09 ppm (180 $\mu g/m^3$)	– [e]	Same as primary standard
	8-hour	–	0.07 ppm (137 $\mu g/m^3$)	0.08 ppm (157 $\mu g/m^3$)	
Carbon monoxide (CO)	1-hour	–	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Same as primary standard
	8-hour	6 ppm	6 ppm [f] (7 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen dioxide (NO_2) [g]	Annual arithmetic mean	–	0.030 ppm (56 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Same as primary standard
	1-hour	–	0.18 ppm (338 $\mu g/m^3$)	–	–
Sulfur dioxide (SO_2)	Annual arithmetic mean	–	–	0.030 ppm (80 $\mu g/m^3$)	–
	24-hour	–	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (365 $\mu g/m^3$)	–
	3-hour	–	–	–	0.5 ppm (1300 $\mu g/m^3$)
	1-hour	–	0.25 ppm (655 $\mu g/m^3$)	–	–
Respirable particulate matter (PM_{10})	Annual arithmetic mean	–	20 $\mu g/m^3$	–	Same as primary standard
	24-hour	–	50 $\mu g/m^3$	150 $\mu g/m^3$	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	–	12 $\mu g/m^3$	15 $\mu g/m^3$	Same as primary standard
	24-hour	–	–	35 $\mu g/m^3$	
Lead [h]	Calendar quarter	–	–	1.5 $\mu g/m^3$	Same as primary standard
	30-Day average	–	1.5 $\mu g/m^3$	–	–

Table 3.11-1
Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California [a,b]	National [c]	
				Primary [b,d]	Secondary [b,e]
Hydrogen sulfide	1-hour	–	0.03 ppm (42 µg/m^3)	No national standards	
Sulfates	24-hour	–	25 µg/m^3		
Vinyl chloride[h]	24-hour	–	0.01 ppm (26 µg/m^3)		
Visibility-reducing particulate matter	8-hour	*Regional:* Extinction coefficient of 25 Mm-1 (157 km, 97 miles) 50 percent of the year, 34 Mm-1 (115 km, 71 miles) 90 percent of the year. *Subregional:* 50 Mm-1 (48 miles) 50 percent of the year, 125 Mm-1 (19 miles) 90 percent of the year.			

Notes: µg/m^3 = micrograms per cubic meter; km = kilometers; ppm = parts per million; TRPA = Tahoe Regional Planning Agency

[a] California standards for ozone, SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] Concentration expressed first in units in which it was issued. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[c] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current Federal policies.

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] Applicable in the Lake Tahoe Air Basin.

[g] On February 19, 2008, the Office of Administrative Law approved a new NO_2 ambient air quality standard, which lowers the 1-hour standard to 0.19 ppm and establishes a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

[h] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants

Sources: TRPA 2007a, ARB 2008a

expected to occur. (By contrast, for the criteria air pollutants, acceptable levels of exposure can be determined and the ambient standards have been established [Table 3.11-1].) Instead, EPA and, in California, ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum available control technology or best available control technology for toxics to limit emissions. (See the discussion of TACs in the "State" section below for a description of ARB's efforts.) These in conjunction with additional rules set forth by EDCAQMD, described below under "El Dorado County Air Quality Management District," establish the regulatory framework for TACs.

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology for toxics (MACT). For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions of, at a minimum, benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State

ARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (Table 3.11-1).

Criteria Air Pollutants

ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest date practical. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with Federal and State laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. There are 15 nonattainment areas for the national ozone standard and two nonattainment areas for the $PM_{2.5}$ standard. The SIP must show how each area will attain the Federal standards. To do this, the SIP will identify the amount of pollution emissions that must be reduced in each area to meet the standard and the emissions controls needed to reduce the necessary emissions.

ARB and local air pollution control districts are currently developing plans for meeting new NAAQS for ozone and $PM_{2.5}$. The draft strategy for California's 2007 SIP was released in April 2007 and the adopted version transmitted to EPA in November 2007 (ARB 2008b). EPA is reviewing the submittal for approval.

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are required before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to ARB's list of TACs.

Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate best available control technology for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus fleet rule and emissions standards for new urban buses. These rules and standards included more stringent emission standards for some new urban bus engines, beginning with the 2002 model year; zero-emission-bus demonstration and purchase requirements for transit agencies; and reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule. Recent milestones included the low-sulfur diesel fuel requirement, and tighter emissions standards for heavy-duty diesel trucks (effective in 2007 and subsequent model years) and off-road diesel equipment (2011) nationwide. Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) in California have been reduced significantly over the last decade; such emissions will be reduced further through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated-gasoline regulations) and control technologies.

Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures (e.g., low-emission vehicle/clean fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's risk reduction plan, it is expected that concentrations of diesel PM will be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated year-2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

Tahoe Regional Planning Agency

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (Regional Plan). TRPA's Regional Plan, adopted in 1987, consists of several documents: the Goals and Policies, Code of Ordinances, Plan Area Statements, Water Quality Management Plan, Regional Transportation Plan—Air Quality Plan, and Scenic Quality Improvement Plan.

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The Goals and Policies document of the 1987 Regional Plan establishes an overall framework for development and environmental conservation in the Lake Tahoe region. These goals and policies are designed to achieve and maintain adopted environmental threshold carrying capacities (thresholds) and are implemented through the TRPA Code of Ordinances. Chapter II (Land Use Element) of the Goals and Policies document consists of seven subelements, one of which is the Air Quality subelement (TRPA 1987). However, the Air Quality subelement does not contain any specific goals or policies.

TRPA has jurisdiction within the LTAB portion of El Dorado County in regard to air quality. Therefore, the Air Quality subelement of the Goals and Policies document focuses on achieving the NAAQS and CAAQS, as well as special TRPA-adopted regional and subregional visibility standards, and on reducing the deposition of nitrate from oxides of nitrogen (NO_X) emitted by vehicles. TRPA's Code of Ordinances and Regional Transportation Plan contain specific measures designed to monitor and achieve the air quality objectives of the Regional Plan. EDCAQMD's rules and regulations (discussed below) also govern in the Lake Tahoe area.

Code of Ordinances

TRPA adopted Chapter 91 (Air Quality Control) and Chapter 93 (Traffic and Air Quality Mitigation Program) of the TRPA Code of Ordinances (TRPA 2004). The applicable provisions of these chapters are described below.

Chapter 91—Air Quality Control

The provisions of Chapter 91 apply to direct sources of air pollution in the Lake Tahoe region, including certain motor vehicles registered in the region, combustion heaters installed in the region, open burning and stationary sources of air pollution, and idling combustion engines:

- Section 91.2, "Vehicle Inspection and Maintenance Program, states that to avoid duplication of effort in implementation of an inspection/maintenance program for certain vehicles registered in the CO nonattainment area, TRPA shall work with the affected State agencies to plan for applying State inspection/maintenance programs to the Lake Tahoe region.

- Section 91.3, "Combustion Appliances, establishes emissions standards for wood heaters, as well as natural gas– or propane-fired water heaters and central furnaces.

- Section 91.5.B "Environmental Assessment," states that any new stationary source of air pollution that produces emissions for the peak 24-hour period beyond any of the limits in Table II, reproduced as Table 3.11-2 below, shall be considered to have a significant adverse environmental impact. New stationary sources that have a significant adverse environmental impact shall be prohibited.

Table 3.11-2 TRPA Peak 24-Hour Period Limits for Stationary Sources		
Pollutant	Kilograms	Pounds
Nitrogen Dioxide	11.0	24.2
PM_{10}	10.0	22.0
Volatile Organic Compounds (Reactive Organic Gases)	57.0	125.7
Sulfur Dioxide	6.0	13.2
Carbon Monoxide	100.0	220.5

Notes: PM_{10} = respirable particulate matter; TRPA = Tahoe Regional Planning Agency
Source: TRPA 2004

Chapter 93—Traffic and Air Quality Mitigation Program

The purpose of Chapter 93 of the TRPA Code of Ordinances is to establish fees and other procedures to offset impacts from indirect sources of air pollution. As part of a project application for any additional development that would result in an increase of more than 200 daily vehicle trips, a technically adequate analysis of potential traffic and air quality impacts must be prepared (Section 93.3.B). To offset regional and cumulative impacts, project proponents must contribute to the air quality mitigation fund, or they may provide mitigation measures that cost at least as much as the required contribution to the air quality mitigation fund (Section 93.3.C[1]). Such regional and cumulative mitigation measures may include transportation systems management measures such as bicycle facilities and pedestrian facilities. For new residential units, the required contribution would be $270 per daily vehicle trip (Section 93.3.D).

Regional Transportation Plan—Air Quality (Goals and Policies, Action Element)

The purpose of the *Regional Transportation Plan—Air Quality Plan* (RTP-AQP) is to attain and maintain the thresholds established by TRPA in 1982, and all applicable Federal, State, and local standards established for transportation and air quality. The RTP-AQP contains specific measures designed to monitor and achieve the air quality objectives of its Regional Plan and to attain and maintain the TRPA thresholds (TRPA 1982).

TRPA thresholds address CO, ozone, regional and subregional visibility, and nitrate deposition. There are numerical standards for each of these parameters, in addition to management standards that are intended to assist in attaining the thresholds. The management standards include reducing wood smoke, maintaining NO_X levels, reducing traffic volumes on U.S. 50, and reducing vehicle miles of travel. These thresholds and associated management standards are described in more detail in the following section. In addition, the Compact states that the Regional Plan shall provide for attaining and maintaining Federal, State, or local air quality standards, whichever are strictest, in the respective portions of the region for which the standards are applicable.

Environmental Threshold Carrying Capacities

Thresholds are used by TRPA to set environmental goals and standards for the Tahoe Basin. TRPA threshold criteria have been established for water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation. Every 5 years TRPA conducts a comprehensive evaluation of whether each threshold is being achieved and/or maintained, makes specific recommendations to address problem areas, and directs general planning efforts for the next 5-year period. The most recent threshold evaluation was completed and adopted by the TRPA Governing Board in 2006 (TRPA 2007a, 2007b).

The thresholds for air quality are listed below (TRPA 2007a).

Carbon Monoxide

- **Numerical Standard:** Maintain CO concentrations at or below 6.0 ppm averaged over 8 hours.

- **Management Standard:** Reduce average daily traffic volume between 4:00 p.m. and midnight in the U.S. 50 corridor by 7 percent from the 1981 base year during the months of November through February.

Ozone

- **Numerical Standard:** Maintain ozone concentration below 0.08 ppm averaged over 1 hour.

Regional Visibility

- **Numerical Standards:**

  - Achieve 156 kilometers (97 miles) at least 50 percent of the year as measured by aerosol concentrations measured at the Bliss State Park monitoring site.

  - Achieve 115 kilometers (71 miles) at least 90 percent of the year as measured by aerosol concentrations measured at the Bliss State Park monitoring site.

- **Management Standard:** Reduce wood smoke emissions by 15 percent of the 1981 base values through technology, management practices, and educational programs.

Subregional Visibility

- **Numerical Standards:**

  - Achieve 78 kilometers (48 miles) at least 50 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.

  - Achieve 31 kilometers (19 miles) at least 90 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.

- **Management Standards:**

  - Reduce suspended soil particles by 30 percent of the 1981 base values through technology, management practices, and educational programs.

  - Reduce wood smoke emissions by 15 percent of the 1981 base values through technology, management practices, and educational programs.

  - Reduce vehicle miles of travel by 10 percent of the 1981 base values.

Atmospheric Deposition

- **Water Quality Numerical Standard:** Reduce dissolved inorganic nitrogen loading to Lake Tahoe from all sources by 25 percent of the 1973–1981 annual average.

- **Management Standards:**

  - Reduce dissolved inorganic nitrogen loads from surface runoff by approximately 50 percent, from groundwater approximately 30 percent, and from atmospheric sources approximately 20 percent of the

1973–1981 annual average. This threshold relies on predicted reductions in pollutant loadings from out-of-basin sources as part of the total pollutant loading reduction.

- Reduce the transport of nitrates into the LTAB and reduce oxides of nitrogen produced in the LTAB consistent with water quality thresholds.

- Reduce vehicles miles of travel in the Lake Tahoe Basin by 10 percent of the 1981 base year values.

These current thresholds are presented above in Table 3.11-1.

El Dorado County

Overview

EDCAQMD attains and maintains air quality conditions in El Dorado County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of EDCAQMD includes preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. EDCAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and CCAA. Air quality plans applicable to the project vicinity are discussed below.

Criteria Air Pollutants

The 1994 *Sacramento Regional Clean Air Plan* was developed cooperatively with all the air quality management districts (AQMD) and air pollution control districts (APCD) in the Sacramento Region (EDCAQMD, Feather River AQMD, Placer County APCD, Sacramento Metropolitan AQMD, and Yolo-Solano AQMD). The plan was adopted in 1994 in compliance with the Federal 1990 CAAA. At that time, the region could not show that it would meet the Federal 1-hour ozone standard by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of “severe nonattainment” for the Federal 1-hour ozone standard, with additional emissions requirements imposed on stationary sources. Updates to the plan were adopted in 1999 and 2002. A new clean-air plan was published in March 2009 and has been submitted to the ARB and EPA for final approval on March 26, 2009. The plan has not yet been adopted.

Adopted EDCAQMD rules and regulations in effect at the time of construction should be considered. Specific rules applicable to the construction of the proposed project may include but are not limited to the following:

- **Rule 202—Visible Emissions.** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- **Rule 223-1—Fugitive Dust–Construction.**

  A. **PURPOSE:** The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

  B. **APPLICABILITY:** The provisions of this rule are applicable to specified outdoor fugitive dust sources. The definitions, exemptions, requirements, administrative requirements, recordkeeping requirements, and test methods set forth in this rule are applicable to Rules 223, 223-1 and 223-2 of the Rules and Regulations of the El Dorado County Air Quality Management District.

As discussed above, TRPA has jurisdiction over air quality considerations in the LTAB portion of El Dorado County, although EDCAQMD's rules and regulations are also applicable within TRPA's jurisdiction (EDCAQMD 2002: Chapter 3, Page 6).

Toxic Air Contaminants

Local APCDs or AQMDs may adopt and enforce ARB control measures (described above in the discussion of State regulations). Under EDCAQMD Regulation V, all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air toxics control measures. EDCAQMD limits emissions and public exposure to TACs through several programs. EDCAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by EDCAQMD (e.g., through a health risk assessment) based on their potential to emit toxics. If it is determined that the source would emit TACs in excess of EDCAQMD's threshold of significance for TACs, as identified below, sources must implement the best available control technology for TACs (T-BACT) to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, EDCAQMD will deny the permit. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that EDAQMD's air quality permitting process applies to stationary sources; properties that are exposed to elevated levels of TACs from nonstationary type sources, and the nonstationary type sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (e.g., cars, trucks) are not required to implement T-BACT, even if they have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the Federal and State levels.

Odors

EDCAQMD has determined some common types of facilities that have been known to produce odors: wastewater treatment facilities, chemical manufacturing plants, painting/coating operations, feed lots/dairies, composting facilities, landfills, and transfer stations. Because offensive odors rarely cause any physical harm, and Federal and State air quality regulations do not contain any requirements for their control are included in Federal or State air quality regulations, EDCAQMD has no rules or standards related to odor emissions other than its nuisance rule:

- **Rule 205—Nuisance.** A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons, or to the public, or which endanger the comfort, repose, health or safety of any such persons, or the public, or which cause to have a natural tendency to cause injury or damage to business or property. The provisions of Rule 205 do not apply to odors emanating from agriculture operations necessary for the growing of crops or raising of fowl or animals.

Any actions related to odors are based on citizen complaints to local governments and EDCAQMD.

ENVIRONMENTAL SETTING

The study area is located in the southern portion of the LTAB. The LTAB comprises portions of El Dorado and Placer Counties on the California side, and Washoe County, Douglas County, and the Carson City Rural District on the Nevada side.

The ambient concentrations of air pollutant emissions are determined by the amount of pollutants emitted and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as climate, meteorology, and topography, in addition to the level of emissions by existing air pollutant sources. These factors are discussed separately below.

Climate, Meteorology, and Topography

Overview

Lake Tahoe lies in a depression between the crests of the Sierra Nevada and Carson ranges on the California-Nevada border at a surface elevation of approximately 6,260 feet above sea level. The LTAB is defined by the 7,000-foot contour, which is continuous around the lake, except near Tahoe City. The mountains surrounding the lake are approximately 8,000–9,000 feet in height on average, with some reaching 10,000 feet.

The constant water temperature of Lake Tahoe at 600 feet below the surface is approximately 39 degrees Fahrenheit (ºF). This characteristic and the lake's topographic location combine to define one of the LTAB's most important atmospheric regimes: in the absence of strong synoptic weather systems (large-scale system, 620 miles or more), the LTAB develops shallow subsidence and radiation inversions throughout the year (air temperature variations unique to the basin relative to surrounding areas). In addition, rapid radiation cooling at night regularly generates gentle downslope nocturnal winds that blow from the mountain ridges down to the shore, then fan across the lake (Cahill and Cliff 2000: 1).

Pollutants from local sources are trapped by frequent inversions in the LTAB, greatly limiting the volume of air into which the pollutants are mixed (e.g., diluted), which results in accumulation and elevated concentrations of pollutants. Further, each night the downslope winds transport local pollutants from nearby developed areas out over the lake, increasing the opportunity for pollutants to deposit. This meteorological regime, characterized by weak or calm winds and a strong inversion, is the most common pattern at all times of the year (Cahill and Cliff 2000: 1).

A second important meteorological regime is the transport of pollutants from the Sacramento Valley and San Francisco Bay Area because winds from these areas move upslope in the Sierra Nevada and the lake is located directly east of the Sierra Nevada crest. This pattern develops when the western slopes of the Sierra Nevada are heated, which causes the air to rise in a chimney effect and move upslope to the Sierra crest and over into the LTAB. The strength of this pattern depends on the amount of heating; thus it is strongest in summer, beginning in April and essentially ceasing in late October (Cahill and Cliff 2000: 1).

Other regimes in the LTAB are defined by strong synoptic weather patterns that overcome the dominant terrain-defined meteorology regimes discussed above. The most important is the winter storm regime, which is responsible for precipitation primarily in the form of snow (Cahill and Cliff 2000: 1).

Each of the meteorological regimes could influence pollution concentrations in the LTAB. Concentrations of pollutants typically increase when local inversions are present, trapping emissions, and when conditions allow pollution to be transported from the western slopes of the Sierra Nevada, the Sacramento Valley, and San Francisco Bay. Recent studies have even shown spring and fall contributions to local pollution levels from Asia. Periods of low pollution concentrations are associated with winter storms and high winds. Winter storms dilute the local and upwind pollution with strong vertical mixing and the incorporation of clean North Pacific air (Cahill and Cliff 2000: 1).

Local meteorological conditions representative of the study area are recorded at the South Lake Tahoe Airport Station. The annual normal precipitation is approximately 15 inches and occurs primarily from November through March in the form of snowfall. January temperatures average approximately 26ºF and August temperatures average approximately 63ºF (WRCC 2008a). The annual predominant wind direction and mean speed is from the south at 6 miles per hour (mph) (WRCC 2008b).

Criteria Air Pollutants

Concentrations of ozone, CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

A brief description of each criteria air pollutant—source types, health effects, and future trends—is provided below along with a description of the most current emissions inventory, attainment area designations, and monitoring data for the study area.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels. A highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional scale, ozone is a regional pollutant.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004: 169, 170).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 ppm to 0.40 ppm for 1–2 hours has been found to substantially alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes (the amount of air inhaled and exhaled), and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence exists relating ozone exposure to an increase in permeability of respiratory epithelia; such increased permeability leads to an increased response of the respiratory system to challenges, and a decrease in the immune system's ability to defend against infection (Godish 2004: 169, 170).

Ozone emissions have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. Peak levels have not declined as much as the number of days when standards are exceeded has declined. From 1990 to 2006, the maximum peak 8-hour indicator decreased by 6 percent. The number of State 8-hour exceedance days declined by 75 percent. Most of this progress occurred after 1999. However, there were no exceedance days in 2003, 2004, and 2005 and just two in 2006; these were among the lowest rates in the 17-year period (ARB 2008c). Data from 2006 showing the trend in 3-year averages of 8-hour ozone data indicate that the LTAB continues to be in attainment for the national and State ozone standards (ARB 2008c: 3-7).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77 percent of the nationwide CO emissions are from mobile sources. The other 23 percent consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2008a).

The highest concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to problems caused by ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal-combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (EPA 2008b). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent to NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms during or shortly after exposure, including coughing, difficulty with breathing, vomiting, headache, and eye irritation. After approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has occasionally been linked with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions (EPA 2008b).

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis (EPA 2008d).

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (EPA 2008c). $PM_{2.5}$ is a subgroup of PM_{10}, consisting of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2008c).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine particulate matter (referred to as the "piggybacking effect"), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2008c). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} remained relatively unchanged between 1975 and 2005 and are projected to remain unchanged through 2020. PM_{10} emissions in the LTAB are dominated by emissions from areawide sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion. The annual average concentrations for California remained relatively constant from 1999 through 2005, with a slight drop in 2006. The trends are different because of differences in State and national monitoring methods. $PM_{2.5}$ emissions in the LTAB are dominated by emissions from the same areawide sources as PM_{10} (ARB 2008c: 3-12).

Lead

Lead is a metal found naturally in the environment and in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline (discussed in detail below), metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995 (EPA 2008e).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95 percent between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A national health and nutrition examination survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (EPA 2008e).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story with regard to air quality management. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the State lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a toxic air contaminant (TAC).

Monitoring Station Data and Attainment Area Designations

Concentrations of criteria air pollutants are measured at several monitoring stations in the LTAB. The South Lake Tahoe–Sandy Way and South Lake Tahoe–1901 Airport Road stations are the closest monitoring stations to the study area with recent data for ozone, CO, NO_2, $PM_{10,}$ and $PM_{2.5}$. In general, the measurements of ambient air quality from these monitoring stations are representative of the air quality in the vicinity of the study area. Table 3.11-3 summarizes the air quality data from these stations for the past 3 years, 2005–2007.

Table 3.11-3
Summary of Annual Air Quality Data (2005–2007)[1]

	2006	2007	2008
Ozone[2]			
Maximum concentration (1-hour/8-hour, ppm)	0.086/0.075	0.090/0.073	0.091/0.077
Number of days State standard exceeded (1-hour/8-hour)	0/2	0/5	0/5
Number of days national standard exceeded (1-hour/8-hour)	0/0	0/0	0/1
Respirable Particulate Matter (PM_{10})[3]	2005	2006	2007
Maximum Concentration (μg/m^3) (California)	33.0	66.6	55.6
Number of days State standard exceeded (measured/calculated[4])	0/0	3/3	2/–
Number of days national standard exceeded (measured/calculated[4])	0/0	–/–	–/–

Notes: μg/m^3 = micrograms per cubic meter,— = data not available; ppm = parts per million

1 Data provided from the South Lake Tahoe–Sandy Way and South Lake Tahoe–1901 Airport Road monitoring stations, as noted below. Data on carbon monoxide, nitrogen dioxide, sulfur dioxide, and fine particulate matter not available for the Lake Tahoe Air Basin.

2 Data from the South Lake Tahoe–1901 Airport Road Station.

3 Data from the South Lake Tahoe–Sandy Way Station, data not collected after 2007.

4 Measured days are those days that an actual measurement was greater than the level of the State daily standard or the national daily standard. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2009

EPA, ARB, and TRPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are “nonattainment,” “attainment,” and “unclassified.” “Unclassified” is used in areas that cannot be classified on the basis of available information as meeting or not meeting the standards. The most current national, State, and TRPA attainment designations for the El Dorado County portion of the LTAB are shown in Table 3.11-4 for each criteria air pollutant. Table 3.11-4 also contains the TRPA threshold attainment designations from the *2006 Thresholds Evaluation Report* (TRPA 2007a: 2-8).

Emissions Inventory for Criteria Air Pollutants

Table 3.11-5 summarizes emissions of criteria air pollutants within the LTAB portion of El Dorado County for various source categories. According to El Dorado County’s LTAB emissions inventory, mobile sources are the largest contributor to the estimated annual average air pollutant levels of ROG, CO, NO_X, and oxides of sulfur (SO_X), accounting for approximately 63, 68, 90, and 100 percent, respectively, of the total emissions. Areawide sources account for approximately 92 percent, and 90 percent of the county’s PM_{10} and $PM_{2.5}$ emissions, respectively.

Table 3.11-4
Attainment Status Designations for the El Dorado County Portion of the Lake Tahoe Air Basin

Pollutant	National Designation	State Designation	TRPA Designation
Ozone—1-hour	–	Unclassified	Nonattainment
Ozone—8-hour	Attainment/Unclassified	–	–
PM_{10}	Attainment/Unclassified	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment/Unclassified	Attainment	–
CO	Attainment/Unclassified	Attainment	Nonattainment
NO_2	Attainment/Unclassified	Attainment	–
SO_2	Attainment	Attainment	–
Lead (Particulate)	Attainment/Unclassified	Attainment	–
Hydrogen Sulfide	–	Unclassified	–
Sulfates	–	Attainment	–
Visibility Reducing Particulates	–	Unclassified	Attainment
Traffic Volume	–	–	Attainment
Wood Smoke	–	–	Unknown[1]
Vehicle Miles of Travel	–	–	Nonattainment
Atmospheric Deposition—TRPA Interim Target	–	–	Unknown[1]
Atmospheric Deposition—TRPA Standard	–	–	Unknown[1]

Notes: CO = carbon monoxide; NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = respirable particulate matter; SO_2 = sulfur dioxide; TRPA = Tahoe Regional Planning Agency.

[1] The status of these standards is unknown because the technology necessary to determine base year values does not exist, and the original standards and indicators were not well defined.

Sources: ARB 2008d, EPA 2008f, TRPA 2007a: 2-8

Toxic Air Contaminants

Concentrations of TACs are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

Table 3.11-5 Summary of 2006 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (El Dorado County—Lake Tahoe Air Basin)						
Source Type/Category	Estimated Annual Average Emissions (Tons per Day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	0.0	0.0	0.1	0.0	0.0	0.0
Waste Disposal	0.0	0.1	0.0	0.0	0.0	0.0
Cleaning and Surface Coating	0.1	–	–	–	–	–
Petroleum Production and Marketing	0.0	–	–	–	–	–
Industrial Processes	–	0.0	0.0	0.0	0.0	0.0
Subtotal (Stationary Sources)	0.2	0.1	0.1	0.0	0.0	0.0
Areawide Sources						
Solvent Evaporation	0.7	–	–	–	–	–
Miscellaneous Processes	0.8	10.3	0.2	0.0	3.6	1.8
Subtotal (Areawide Sources)	1.5	10.3	0.2	0.0	3.6	1.8
Mobile Sources						
On-Road Motor Vehicles	1.1	11.3	1.5	0.0	0.1	0.0
Other Mobile Sources	1.6	10.6	2.0	0.0	0.2	0.2
Subtotal (Mobile Sources)	2.7	21.9	3.5	0.1	0.3	0.2
Total for El Dorado County in Lake Tahoe	**4.3**	**32.3**	**3.9**	**0.1**	**3.9**	**2.0**

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; SO_X = oxides of sulfur; $PM_{2.5}$ = fine particulate matter; PM_{10} = respirable particulate matter; ROG = reactive organic gases
Source: ARB 2008e

Diesel Particulate Matter

According to the *California Almanac of Emissions and Air Quality* (ARB 2008c: Chapter 5), most of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing risk in California of the TACs for which data are available.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, ARB estimated the California statewide average diesel PM health risk in 2000 to be 540 excess cancer cases per million people. Since 1990, the health risk of diesel PM in California has been reduced by 40 percent.

Overall, levels of most TACs, except for para-dichlorobenzene and formaldehyde, have declined since 1990 (ARB 2008c: Chapter 5).

Existing sources of TACs in the project vicinity include mobile-source emissions from the nearby highway (i.e., U.S. 50) and from minor stationary sources, such as the South Lake Tahoe Airport. There are no major existing stationary sources of TACs near the study area (ARB 2008f, ARB 2008g).

Naturally Occurring Asbestos

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Naturally occurring asbestos, which was identified as a TAC by ARB in 1986, is located in many parts of California and is commonly associated with serpentine.

According to two reports by the California Department of Conservation, Division of Mines and Geology, *Areas More Likely to Contain Naturally Occurring Asbestos in Western El Dorado County* and *A General Location Guide to Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill 2000, Churchill and Hill 2000: 2), the study area is not likely to contain naturally occurring asbestos.

Odors

Odors are typically regarded as an annoyance rather than a health hazard. However, a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell minute quantities of specific substances; others may not have the same sensitivity, but may be sensitive to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person may be perfectly acceptable to another (e.g., some odors at fast-food restaurants). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and the odor is recognized only when its intensity changes.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the odor is quite difficult to detect or recognize. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

No major odor sources (e.g., wastewater treatment facilities, landfills, food processing facilities) exist in the project vicinity.

GREENHOUSE GAS EMISSIONS

Federal Plans, Policies, Regulations, and Laws

Supreme Court Ruling

The EPA is the Federal agency responsible for implementing the Federal CAA. The Supreme Court of the United States ruled on April 2, 2007 that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of greenhouse gases (GHGs) (Massachusetts et al. v. Environmental Protection Agency et al. Case No. 05-1120). However, there are no Federal regulations or policies regarding GHG emissions applicable to the project alternatives.

EPA Proposed Regulations

In response to the mounting issue of climate change, EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions. Although both actions discussed below are still in the proposal stage, they would have implications on the regulation, monitoring, and reduction of GHG emissions from stationary and mobile sources.

Proposed Mandatory Greenhouse Gas Reporting Rule

On April 10, 2009, EPA published its Proposed Mandatory Greenhouse Gas Reporting Rule (proposed reporting rule) in the *Federal Register*. The proposed reporting rule is a response to the FY 2008 Consolidate Appropriations Act (H.R. 2764; Public Law 110-161), which required EPA to develop "…mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy…." The proposed reporting rule would apply to fossil fuel and industrial GHG suppliers, vehicle and engine manufacturers, and all facilities that would emit 25,000 metric tons of CO_2e or more per year. Facility owners would be required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The proposed reporting rule would also mandate record keeping and administrative requirements in order for EPA to verify annual GHG emissions reports. Owners of existing facilities that commenced operation prior to January 1, 2010 would be required to submit an annual report for calendar year 2010. Owners of new facilities commencing operation after January 1, 2010 would be required to submit an annual report from the facility's commencement date to December 31, 2010. For all subsequent operating years, facility owners would be required to report GHG emissions for the whole calendar year (January 1 to December 31). The comment period on the proposed reporting rule ended on June 6, 2009.

Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act

On April 23, 2009, EPA published their Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CCA (Endangerment Finding) in the *Federal Register*. The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The proposed rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perflurorocarbons [PFCs], and sulfur hexafluoride [SF_6]) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change.

The Administrator proposed the finding that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CCA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, higher intensity storms, and changes in snow storage) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations.

The Administrator also proposed the finding that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. The proposed finding cites that in 2006 (74 *Federal Register* 18907, Friday, April 24, 2009), motor vehicles were the second largest contributor to domestic GHG emissions (24% of total) behind electricity generation. Furthermore, in 2005, the U.S. was responsible for 18% of global GHG emissions. Therefore, GHG emissions from motor vehicles and motor vehicle engines were found to contribute to air pollution that endangers public health and welfare.

State Plans, Policies, Regulations, and Laws

ARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA, which was adopted in 1988.

Greenhouse Gases

Various statewide and local initiatives to reduce the state's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way, and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can help to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and State legislature describing: progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created the California Climate Action Team (CCAT) made up of members from various State agencies and commission. CCAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through State incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 Climate Change Scoping Plan

On December 11, 2008, ARB adopted the *Climate Change Scoping Plan* (*Scoping Plan*), which is the State's plan to achieve GHG reductions in California required by AB 32 (ARB 2008h: ES-1). The *Scoping Plan* contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO_2e, or approximately 30% from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO2e, or almost 10%, from 2002-2004 average emissions). The *Scoping Plan* also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reductions are recommended from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO_2e, discussed below), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

Senate Bill 97

Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the California Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. The California Natural Resources Agency adopted those guidelines on December 31, 2009, within the legislated deadline of January 1, 2010. These CEQA Guideline amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of greenhouse gas emissions in draft CEQA documents. The Natural Resources Agency conducted formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by SB 97. The adopted amendments to the State CEQA Guidelines were effective as of March 18, 2010 and included, among other things, provisions for determining significance of GHG emissions, mitigating significant GHG impacts, streamlining of CEQA analysis of GHG impacts, and additional questions in the Appendix G checklist.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets.

ATTRIBUTING CLIMATE CHANGE—THE PHYSICAL SCIENTIFIC BASIS

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on Earth. Without the greenhouse effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, N_2O, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is *extremely unlikely* that global climate change of the past 50 years can be explained without the contribution from human activities (IPCC 2007: Summary, Page 10).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants (TACs), which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998: 1090, 1091).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say, the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

3.11.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. In development of mitigation measures for significant impacts of the project, effects on environmental threshold of the Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.5, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, an air quality impact is considered significant if implementation of the proposed project would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation (Table 3.11-1);
- result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under any applicable National or State ambient air quality standards (including releasing emissions that exceed quantitative standards for ozone precursors);

- expose sensitive receptors to substantial pollutant concentrations (including TACs/HAPs); or
- create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance criteria established by the applicable AQMD or APCD may be relied on to make the above determinations. Thus, as identified by EDCAQMD, an air quality impact also is considered significant if implementation of the proposed project would result in:

- short-term construction-related or long-term operation-related (regional) emissions of ROG or NO_X that exceed mass emissions of 82 pounds per day (lb/day) (EDCAQMD 2002:Chapter 3, page 5)

Appendix G of the State CEQA Guidelines were updated to address impacts of GHG emissions with the adoption of amendments, as directed by Senate Bill 97 (Statutes of 2007). OPR has added the following questions to Appendix G. An impact related to global climate change is considered significant if the proposed project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or,
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

For the purposes of this analysis, State Parks has decided to quantify total GHG emissions from the proposed Alternatives, and determine whether the associated emissions would substantially help or hinder the State's ability to attain the goals identified in AB 32 (i.e., reduction of statewide GHG emissions to 1990 levels by 2020). The approach to the discussion is presented below.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative was determined to have a significant impact on air quality if it would result in:

- substantial air pollutant emissions;
- deterioration of ambient (existing) air quality;
- the creation of objectionable odors;
- alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally; or
- increased use of diesel fuel.

METHODS AND ASSUMPTIONS

Almost all increased pollutant emissions that would be associated with the improvements in the study area would be generated by construction-related activities. The number of visitors to the study area is not expected to change substantially. Construction emissions are described as short term or temporary in duration. These emissions, especially emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (e.g., ROG and NO_X), have the potential to represent a significant air quality impact.

The method of analysis for short-term construction, long-term operational (regional), local mobile-source, and TAC emissions is consistent with the recommendations of EDCAQMD and TRPA. Short-term construction- and long-term operation-related emissions of ROG, NO_X, and PM_{10} were modeled using Urban Emissions Model (URBEMIS) 2007 (Version 9.2.4) computer program and EMFAC 2007 emission factors, as recommended by EDCAQMD and TRPA. The equipment lists shown in the project description provide total equipment usage for each construction season (May 1 through October 15) through project completion. Not every piece of equipment would be used every day and many pieces would only be used for certain components of each phase. Therefore for modeling purposes it was assumed that each piece of equipment would operate on average 4 hours per day for the entire construction phase. In addition, ARB restricts diesel equipment idling to 5 minutes, so it was assumed that equipment not in use would be powered off.

Climate Change

The EDAQMD has not adopted significance criteria for analyzing GHG emissions generated by development, or a methodology for analyzing impacts related to GHG emissions or global climate change. By enactment of AB 32 and SB 97, the state of California has identified GHG reduction goals and determined that the effect of GHG emissions on global climate change is an adverse environmental impact issue. While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change.

To meet AB 32 goals, California would need to generate less GHG emissions than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels.

Although the text of AB 32 applies to stationary sources of GHG emissions, this mandate demonstrates California’s commitment to reducing the rate of GHG emissions and the state’s associated contribution to climate change, without intent to limit population or economic growth within the state. Thus, to achieve the goals of AB 32, which are tied to GHG emission rates of specific benchmark years (i.e., 1990), California would have to achieve a lower rate of emissions per unit of population than it has now. Further, in order to accommodate future population and economic growth, the state would have to achieve an even lower rate of emissions per unit than was achieved in 1990. (The goal to achieve 1990 quantities of GHG emissions by 2020 means that this will need to be accomplished with 30 years of population and economic growth beyond 1990 in place.) Thus, future planning efforts that would not encourage reductions in GHG emissions would conflict with the policy decisions contained in the spirit of AB 32, thus impeding California’s ability to comply with the mandate.

If a statewide context for GHG emissions is considered, any net increase in GHG emissions within state boundaries would be considered “new” emissions. For example, in a land development project, such as the proposed project, does not create “new” emitters of GHGs, but would theoretically accommodate a greater number of residents in the state. Some of the residents that move to the project could already be California residents, while some may be from out-of-state (or would ‘take the place’ of in-state residents who ‘vacate’ their current residences to move to the new project). The out-of-state residents would be contributing new emissions in a statewide context, but would not necessarily be generating new emissions in a global context. Given the California context established by AB 32, the project would need to accommodate an increase in population in a manner that would not inhibit the state’s ability to achieve the goals of lower emissions overall.

However, the state of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501[a]). SB 97, however, did amend

CEQA by directing OPR to prepare revisions to the State CEQA Guidelines addressing the mitigation of GHGs or their consequences. As an interim step toward development of required guidelines, in June of 2008, OPR published a technical advisory, entitled "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review." OPR recommends that the lead agencies under CEQA make a good-faith effort, based on available information, to estimate the quantity of GHG emissions that would be generated by a proposed project, including the emissions associated with vehicular traffic, energy consumption, water usage, and construction activities, to determine whether the impacts have the potential to result in a project or cumulative impact and to mitigate the impacts where feasible (OPR 2008).

In that document, OPR acknowledged that "perhaps the most difficult part of the climate change analysis will be the determination of significance," and noted that "OPR has asked ARB technical staff to recommend a method for setting criteria which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." ARB has not yet completed this task at the time of writing.

The EDAQMD has not adopted a methodology for evaluating GHG emissions. In the case of the proposed project, CO_2 emissions associated with project construction and operation were modeled using URBEMIS 2007 version 9.2.4; a model widely-used in regional air quality analysis.

It is important to note that all CO_2 emissions from project operation may not necessarily be considered "new" emissions, given that a project itself does not create "new" emitters (people) of GHGs, at least not in the traditional sense. In other words, the operational GHG emissions for this project are not necessarily all new GHG emissions; to a large degree, recreation projects accommodate existing populations. In this sense, recreation projects can be seen as reacting to increased demand from the growing economy and population, and are not in themselves creators of economic and population growth. Emissions of GHGs are, however, influenced by the location and design of projects, to the extent that they can influence travel to and from the projects, and to the degree the projects are designed to maximize energy efficiency.

The methodology used in this document to analyze the project's potential effect on global warming includes a calculation of GHG emissions. The purpose of calculating the project's GHG emissions is for informational and comparison purposes, as there is no adopted quantifiable threshold for either a project level or cumulative level of impact.

Please refer to Section 3.16, "Cumulative Impacts," of this EIR/EIS/EIS for discussion of greenhouse gas emissions and the project's contribution to the cumulative impact of climate change.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.11-1 (Alt. 1)	**Short-Term Emissions of Criteria Air Pollutants and Precursors during Construction.** *Because no construction activities would occur under Alternative 1, no short-term construction-related emissions would occur.* **No impact** *would occur.*

Implementing Alternative 1 would not result in any construction activities in the study area, and no material hauling would occur. The study area would remain in its current state as an 18-hole championship golf course and passive recreation area. No project-related heavy equipment exhaust or fugitive dust emissions would be created. As a result, no new short-term construction-related emissions of criteria air pollutants (e.g., PM_{10}) or precursors (e.g., ROG and NO_X) would occur. Therefore, no impact would occur.

No mitigation is required.

IMPACT 3.11-2 (Alt. 1)	**Long-Term Operational (Regional) Emissions of Criteria Air Pollutants and Precursors.** *No new long-term operational emissions sources would result from implementing Alternative 1, and use of the study area would remain comparable to existing use. Vehicle emissions from recreation activity would remain at existing levels.* ***No impact*** *would occur.*

Alternative 1 would not include any new stationary, area, or mobile sources of emissions associated with project operation. No land use changes would occur in the study area, which would remain in its current state as an 18-hole championship golf course and passive recreation area, and use of the area would remain comparable to existing use. Non-project related fuels reduction programs or maintenance for public utilities would continue during summer. Work crews would typically use small pieces of equipment and other power tools, such as chainsaws, haul trucks, and chippers. Fuels reduction activities may include thinning, pruning, prescribed burning, and chipping. Public utility work would include routine line maintenance and repair. Emissions from the vehicles of recreation-related visitors to the study area would be unchanged from existing emission levels. Because no new stationary, area, or mobile sources of missions would result from implementation of Alternative 1, no impact would occur.

No mitigation is required.

IMPACT 3.11-3 (Alt. 1)	**Long-Term Operational (Local) Emissions of Carbon Monoxide by Mobile Sources.** *No long-term change would occur to traffic levels from activities in the study area under Alternative 1; thus, implementing Alternative 1 would not increase CO levels on nearby local roadways.* ***No impact*** *would occur.*

Implementing Alternative 1 would not result in a long-term change in traffic caused by project-related activities in the study area. No trip-generating features or parking areas would be developed. Therefore, implementing this alternative would not result in changes to the LOS at signalized intersections in the project vicinity, nor would it result in increased long-term local emissions of CO from mobile sources. No impact would occur.

No mitigation is required.

IMPACT 3.11-4 (Alt. 1)	**Exposure of Sensitive Receptors to Odors.** *Because no construction would occur and no new operations would be created, no sources of odor would be caused by activities in the study area, and odors at nearby sensitive receptors would not change under Alternative 1.* ***No impact*** *would occur.*

Because no action would occur under Alternative 1, the project site would remain in its current state. Implementing Alternative 1 would not result in any additional sources of odors, and existing odors at nearby sensitive receptors would not change. No impact would occur.

No mitigation is required.

IMPACT 3.11-5 (Alt. 1)	**Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Under Alternative 1, no short-term or long-term emissions of HAPs (TACs) would occur. As a result,* ***No impact*** *would occur.*

Implementing Alternative 1 would not result in any project-related construction activities in the study area. The study area would remain in its current state as an 18-hole championship golf course and passive recreation area. Existing HAP sources related to maintenance and fuels reduction programs would continue as they do today. No new HAP emissions would be created by short- or long-term sources. As a result, no short-term or long-term emissions of HAPs (known in State parlance as TACs) would occur. Therefore, no impact would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.11-1 (Alt. 2)	**Short-Term Emissions of Criteria Air Pollutants and Precursors during Construction.** *Construction-related emissions of criteria air pollutants and precursors under Alternative 2 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***significant****.*

Construction emissions are described as short term or temporary in duration and have the potential to represent a significant impact with respect to air quality. Fugitive PM_{10} dust emissions are associated primarily with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT by construction vehicles on- and off-site. Emissions of the ozone precursors ROG and NO_X are associated primarily with exhaust from gas- and diesel-powered equipment and the application of architectural coatings.

Under Alternative 2, the golf course relocation and river restoration phases of construction would temporarily generate emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from excavation, grading, and clearing; use of off-road equipment; import and export of materials; paving; and workers traveling to and from the study area.

Short-term construction-related emissions of ROG, NO_X, and PM_{10} under Alternative 2 were modeled using the URBEMIS 2007 (Version 9.2.4) computer program and EMFAC 2007 emission factors, as recommended by EDCAQMD and TRPA. URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Input parameters were based on default model settings and information provided in Chapter 2, "Description of Alternatives." Project construction is anticipated to be carried out in three phases over 3 years. The first phase is anticipated to begin in spring 2012 with final project completion in fall 2014. Modeling assumed an annual construction period of May 1 through October 15 (120 work days). Emissions generated by construction equipment and vehicles beyond 2012 would likely be the same or less because emissions standards generally become more stringent with time. Therefore, if the start of construction were to be delayed beyond May 2012, emissions generated by construction trips thereafter would be the same or less than described below. The modeled maximum daily construction-related emissions are summarized in Table 3.11-6 and described in more detail below and in Appendix I, "Air Quality Modeling Results."

Based on the results of the modeling conducted, which reflect reasonable, conservatively high assumptions about the level of activity, construction of Alternative 2 would result in maximum unmitigated daily emissions of approximately 12 lb/day of ROG, 94 lb/day of NO_X, and 425 lb/day of PM_{10} (Table 3.11-6). Daily unmitigated, construction-related emissions would exceed EDCAQMD's short-term significance criterion of 82 lb/day for NO_X.

Before compliance with TRPA-recommended mitigation measures, construction-related emissions of PM_{10} under Alternative 2 could violate or contribute substantially to an existing or projected air quality violation. Such emissions could expose sensitive receptors to substantial concentrations of pollutants, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., the 1-hour ozone and visibility-reducing particulate standards). As a result, this impact would be significant.

Table 3.11-6
Summary of Daily Construction-Related Emissions under Alternative 2[1]

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 1 (May 2012–October 2012)			
Fugitive Dust	–	–	245.3
Off-Road Diesel	8.9	68.3	3.9
On-Road Diesel	1.7	27.2	1.1
Worker Trips	0.3	0.6	0.1
Maximum Daily Total, Unmitigated	*10.9*	*96.1*	*250.4*
Maximum Daily Total, Mitigated	*10.4*	*76.9*	*62.6*
Phase 2 (May 2013–October 2013)			
Fugitive Dust	–	–	420.
Off-Road Diesel	8.1	61.9	3.5
On-Road Diesel	1.6	24.0	1.0
Worker Trips	0.2	0.4	0.0
Maximum Daily Total, Unmitigated	*9.9*	*86.3*	*424.5*
Maximum Daily Total, Mitigated	*9.4*	*69.0*	*106.1*
Phase 3 (May 2014–October 2014)			
Fugitive Dust	–	–	420.2
Off-Road Diesel	10.0	72.6	4.4
On-Road Diesel	1.4	20.7	0.7
Worker Trips	0.3	0.5	
Maximum Daily Total, Unmitigated	*11.7*	*93.8*	*425.3*
Maximum Daily Total, Mitigated	*11.1*	*75.0*	*106.2*

Notes: NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases.
See Appendix I, "Air Quality Modeling Results," for modeling results.

[1] On-site emissions from mobile equipment used for site grading were based on default emission factors and durations of URBEMIS 2007, Version 9.2.4. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with Section 62.4.A of the Tahoe Regional Planning Agency (TRPA) Code of Ordinances unless special approval has been granted by TRPA.

Source: Modeling performed by EDAW (now AECOM) in 2009

Mitigation Measure 3.11-1 (Alt. 2): Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}.

In accordance with the TRPA Code of Ordinances and El Dorado County Code, State Parks shall implement the following mitigation measures during construction:

- State Parks shall obtain all necessary TRPA and El Dorado County permits and approvals and shall follow all required TRPA codes and procedures with respect to best management practices (BMPs) (TRPA Code Chapter 25), project grading (TRPA Code Chapter 64), excavation- and construction-related and emissions-generating activities (TRPA Code Chapter 91: Air Quality Control), and all required County laws and procedures with respect to BMPs, project grading and excavation, and construction-related and emissions-generating activities. The following specific emissions-related mitigation measures are recommended by EDCAQMD:

- State Parks shall require the prime contractor to provide an approved plan demonstrating that the heavy-duty (i.e., greater than 50 horsepower) off-road vehicles to be used in project construction and operated by either the prime contractor or any subcontractor will achieve, at a minimum, a fleet-averaged 20-percent NO_X reduction compared to the most recent ARB fleet average. Implementation of this measure requires the prime contractor to submit a comprehensive inventory of all off-road construction equipment greater than 50 horsepower that will be used an aggregate of 40 or more hours during the construction project. The inventory shall include the horsepower rating, engine production year, and hours of use or fuel consumed for each piece of equipment. The inventory shall be updated monthly.

- State Parks shall require that the 15% of on-site equipment include options for reducing criteria air pollutant exhaust emissions such as using late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, and/or after-treatment products.

► Dust control measures shall be required for any grading activity creating substantial quantities of dust. They shall be approved by TRPA before groundbreaking and shall comply with the provisions of Chapter 64.4 of the TRPA Code of Ordinances, El Dorado County Code, and the EDCAQMD-recommended control measures listed below:

- State Parks shall require that the prime contractor enclose, cover, or water twice daily all disturbed soil areas, including storage piles, to keep soil moist at all times.

- State Parks shall require that the prime contractor water all haul roads twice daily.

- State Parks shall require the prime contractor to cover or maintain 2 feet of freeboard on all haul loads to reduce dust emissions from escaping over the side of the truck.

- Activities disturbing the soil shall not occur between October 15 and May 1 of each year, unless approval has been granted by TRPA. All construction sites shall be winterized by October 15 of each construction year in accordance with the provisions of Chapter 64.2.D of the TRPA Code of Ordinances, unless an extension is granted by TRPA.

► State Parks shall require its contractors and suppliers, its general contractor, and all of the general contractor's subcontractors and suppliers to comply with all of the terms and conditions of all project permits, approvals, and conditions attached thereto, including all TRPA and El Dorado County permits and approvals.

Implementation of Mitigation Measure 3.11-1 would reduce fugitive PM_{10} dust emissions by a minimum of approximately 75 percent and would prevent the fugitive PM_{10} dust from dispersing beyond the property boundary. Implementation of this mitigation measure would also reduce exhaust emissions of ROG, NO_X, and PM_{10} from diesel equipment by at least 5, 20, and 45 percent, respectively (WRAP 2006:3, EDCAQMD 2002:4-22 and 4-23). Implementation of Mitigation Measure 3.11-1 would ensure compliance with TRPA regulations for construction emissions, and mitigated daily emissions of NO_X would be reduced below the EDCAQMD mass emission standard of 82 lb/day. This impact would be less then significant with mitigation.

IMPACT 3.11-2 (Alt. 2) **Long-Term Operational (Regional) Emissions of Criteria Air Pollutants and Precursors.** *Long-term operational emissions would not exceed TRPA's significance criteria for stationary sources or the EDCAQMD significance criterion for mass emissions of ROG and NO_X. Therefore, implementation of Alternative 2 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This impact would be* ***less than significant***.

Regional emissions of ROG, NO_X, PM_{10}, CO, and SO_X from area and mobile sources associated with project implementation were estimated using the URBEMIS 2007 (Version 9.4.2) computer program, which is designed to model emissions for land use development projects (including recreation land uses). URBEMIS allows selection of project location specifics and trip generation rates. The program accounts for area-source emissions from the use of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products, as well as mobile-source emissions associated with vehicle trips. Regional emissions from area (e.g., landscaping equipment) and mobile sources were estimated based on proposed land use types and sizes identified in Chapter 2, "Project Alternatives"; the net increase in trip generation from the project's transportation analysis described in Section 3.10, "Transportation, Parking, and Circulation" (e.g., fewer than 8 daily vehicle trips); and the default model setting for 2014 conditions (i.e., the first year of anticipated project operation). No major stationary sources of emissions would be constructed or operated under Alternative 2.

The modeled maximum daily operational emissions under Alternative 2 are summarized in Table 3.11-7 and described in more detail below and in Appendix I, "Air Quality Modeling Results." Estimates are conservative, and actual emissions could be less over time as a result of fluctuations in activity and maintenance.

Based on the modeling conducted, project operations under Alternative 2 would result in maximum unmitigated daily emissions of approximately less than 1 lb/day of ROG, less than 1 lb/day of NO_X, less than 1 lb/day of PM_{10}, 3 lb/day of CO, and less than 1 lb/day of SO_X, none of which would exceed the applicable EDCAQMD standards (Table 3.11-7). These standards are based on SIP requirements to reduce emissions from heavy-duty vehicles and land use projects. Because project implementation would not exceed these standards, Alternative 2 would not conflict with air quality planning efforts.

Table 3.11-7
Summary of Modeled Maximum Long-Term Operational Emissions under Alternative 2–5

Source Type	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Summer					
Area sources [1]	0.13	0.02	0.00	1.60	0.00
Mobile sources [2]	1.29	0.10	0.01	0.80	0.00
Total	*1.42*	*0.12*	*0.01*	*2.40*	*0.00*
Winter					
Area sources [1]	0.00	0.00	0.00	0.00	0.00
Mobile sources [2]	0.10	0.15	0.01	1.14	0.00
Total	*0.10*	*0.15*	*0.01*	*1.14*	*0.00*
Standards					
EDCAQMD Total emissions [3]	*82.00*	*82.00*	–	–	–
TRPA Stationary Source Emissions[4]	125.7	24.2	22.0	220.5	13.2

Table 3.11-7
Summary of Modeled Maximum Long-Term Operational Emissions under Alternative 2–5

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases; SO_X = oxides of sulfur.

[1] Area-source emissions include emissions from landscaping and were estimated based on default model settings.

[2] Mobile-source emissions were estimated based on default model settings and on trip generation rates obtained from the transportation analysis prepared for this project under buildout conditions.

[3] The total emissions standard applies to the sum of area and mobile sources for ROG and NO_X only.

[4] TRPA standards apply to stationary-source emissions only.

Source: Modeling performed by EDAW (now AECOM) in 2009

Long-term operational emissions under Alternative 2 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-3 (Alt. 2) **Long-Term Operational (Local) Emissions of Carbon Monoxide by Mobile Sources.** *Long-term local emissions of CO from mobile sources related to project operation under Alternative 2 would not violate an air quality standard (i.e., the 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant****.*

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land uses, such as residential areas, schools, and hospitals. As a result, the analysis of CO emissions is at a local level.

The *Transportation Project-Level Carbon Monoxide Protocol* (Garza, Graney, and Sperling 1997) states that signalized intersections that operate at an unacceptable LOS represent a potential for a CO violation, also known as a "hot spot," and thus undergo a quantitative screening-level analysis. The Goals and Policies in the TRPA Regional Plan indicate that up to 4 hours of LOS E conditions are acceptable at a signalized intersection (TRPA 1987:III-6). No TRPA standard exists for the operation of unsignalized intersections. Thus, an analysis of CO concentrations is typically recommended for receptors located near signalized intersections that are projected to operate at LOS E (for more than 4 hours per day) or LOS F.

According to the transportation analysis, operation of Alternative 2 would not reduce the LOS at any signalized intersections to an unacceptable level (LOS E or F) during any time of the day or substantially worsen LOS at any signalized intersections (see Section 3.10, "Transportation, Parking, and Circulation," for additional detail). Thus, long-term local emissions of CO from mobile sources during project operation under Alternative 2 would not violate an air quality standard (i.e., the 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.11-4 (Alt. 2) **Exposure of Sensitive Receptors to Odors.** *Neither construction nor operation of Alternative 2 would create objectionable odors affecting a substantial number of people. This impact would be* ***less than significant****.*

Implementation of Alternative 2 would not result in any major sources of odor, and the project's proposed land use type is not one of the types commonly known to generate odors (e.g., landfill, coffee roaster, wastewater treatment plant). Emissions of diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and the exhaust would dissipate rapidly from the source. Thus, neither construction nor operation of Alternative 2 would create objectionable odors affecting a substantial number of people. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.11-5 (Alt. 2) **Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Neither construction nor operation of Alternative 2 would expose sensitive receptors to substantial emissions of HAPs (TACs). As a result, this impact would be* ***less than significant****.*

Construction of Alternative 2 would result in the short-term emission of diesel exhaust by on-site heavy-duty equipment. As shown in Table 3.11-6, off-road diesel-powered equipment operated during project construction would generate approximately 12 lb/day of diesel PM exhaust emissions at the project site during the construction effort (i.e., off-road diesel exhaust during site preparation, off-site hauling). This amount would be lower with implementation of Mitigation Measure 3.11-1 (Alt. 2) because implementing the NO_X and PM reduction measures would reduce emissions of diesel PM. Diesel PM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003). At this time, TRPA has not adopted a methodology for analyzing such impacts and does not recommend the completion of health risk assessments for construction-related emissions of TACs, with a few exceptions (e.g., where construction phase is the only phase of project) (Reed, pers. comm., 2007).

In January 2001, EPA promulgated a final rule to reduce emissions standards for heavy-duty diesel engines beginning with the 2007 model year. These emissions standards represent emissions reductions of 90 percent for NO_X, 72 percent for nonmethane hydrocarbons, and 90 percent for PM relative to the emissions standards for the 2004 model year.

The dose of a substance in the environment to which receptors are exposed—a function of the substance's concentration and the duration of exposure—is the primary factor used to determine the health risks associated with HAPs (known in State parlance as TACs). Dose is positively correlated with time; that is, a longer exposure period would result in a higher exposure level. Thus, the estimated risks are higher if a fixed exposure occurs over a longer period. According to California's Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to HAP emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period and duration of activities associated with the project (Salinas, pers. comm., 2004). Because off-road heavy-duty diesel equipment would be used only temporarily and because of the highly dispersive properties of diesel PM (Zhu et al. 2002) and future reductions in exhaust emissions, construction under Alternative 2 would not expose sensitive receptors to substantial emissions of HAPs.

No major stationary sources of HAP emissions would be constructed or operated with long-term operation of Alternative 2, nor would implementing this alternative result in the generation of HAP emissions from on-site mobile sources (e.g., diesel truck traffic). In addition, no major sources of HAPs exist in the vicinity of the study area. Nonetheless, all stationary sources with the potential to emit HAPs are required to obtain permits from TRPA. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, specifically Chapter 91 (Air Quality Control) of the TRPA Code of Ordinances. Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions in the study area are expected to remain within established standards. Thus, neither construction nor operation of Alternative 2 would expose sensitive receptors to substantial emissions of HAPs. As a result, this impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.11-1 (Alt. 3) **Short-Term Emissions of Criteria Air Pollutants and Precursors during Construction.** *Construction-related emissions of criteria air pollutants and precursors under Alternative 3 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This impact would be* ***significant****.*

As described under Impact 3.11-1 (Alt. 2), construction emissions of fugitive PM_{10} dust, ROG, and NO_X have the potential to represent a significant short-term impact with respect to air quality. Under Alternative 3, the study area restoration and reduced play golf course phases of construction would temporarily generate emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from excavation, grading, and clearing; use of off-road equipment; import and export of materials; and workers traveling to and from the study area. Modeling was conducted using the same protocol as described for Alternative 2.

The modeled maximum daily construction-related emissions are summarized in Table 3.11-8 and described in more detail below and in Appendix I, "Air Quality Modeling Results."

Based on the modeling conducted , construction of Alternative 3 would result in maximum unmitigated daily emissions of approximately 10 lb/day of ROG, 79 lb/day of NO_X, and 334 lb/day of PM_{10} (Table 3.11-8).

Table 3.11-8
Summary of Daily Short-Term Construction-Related Emissions under Alternative 3[1]

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 1 (May 2011–October 2011)			
Fugitive Dust	–	–	200.4
Off-Road Diesel	2.4	18.3	1.0
On-Road Diesel	1.4	21.5	0.7
Worker Trips	0.1	0.2	0.0
Maximum Daily Total, Unmitigated	*3.8*	*40.0*	*202.1*
Maximum Daily Total, Mitigated	*3.6*	*32.0*	*50.5*
Phase 2 (May 2012–October 2012)			
Fugitive Dust	–	–	330.1
Off-Road Diesel	5.9	45.4	2.5
On-Road Diesel	1.2	19.0	0.7
Worker Trips	0.2	0.4	0.0
Maximum Daily Total, Unmitigated	*7.3*	*64.8*	*333.3*
Maximum Daily Total, Mitigated	*6.9*	*51,8*	*83.3*

Table 3.11-8
Summary of Daily Short-Term Construction-Related Emissions under Alternative 3[1]

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 3 (May 2013–October 2013)			
Fugitive Dust			330.0
Off-Road Diesel	8.2	62.1	3.3
On-Road Diesel	1.1	16.4	0.7
Worker Trips	0.2	0.4	0.0
Maximum Daily Total, Unmitigated	*9.5*	*78.9*	*334.0*
Maximum Daily Total, Mitigated	*9.0*	*63.1*	*83.3*

Notes: NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases.
See Appendix I, "Air Quality Modeling Results," for modeling results.
[1] On-site emissions from mobile equipment used for site grading were based on default emission factors and durations of URBEMIS 2007, Version 9.2.4. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with Section 62.4.A of the Tahoe Regional Planning Agency (TRPA) Code of Ordinances unless special approval has been granted by TRPA.
Source: Modeling performed by EDAW (now AECOM) in 2009

Before compliance with TRPA-recommended mitigation measures, construction-related emissions of PM_{10} under Alternative 3, could violate or contribute substantially to an existing or projected air quality violation. Such emissions could expose sensitive receptors to substantial concentrations of pollutants, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., the 1-hour ozone and visibility-reducing particulate standards). As a result, this impact would be significant.

Mitigation Measure 3.11-1 (Alt. 3): Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}. This mitigation measure is identical to Mitigation Measure 3.11-1 (Alt. 2).

For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.11-1 (Alt. 3), Impact 3.11-1 (Alt. 3) would be less than significant with mitigation.

IMPACT 3.11-2 (Alt. 3)

Long-Term Operational (Regional) Emissions of Criteria Air Pollutants and Precursors. *Long-term operational emissions would not exceed TRPA's significance criteria for stationary sources or the EDCAQMD significance criterion for mass emissions of ROG and NO_X. Therefore, implementation of Alternative 3 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.11-2 (Alt. 2). Alternative 3 would have vehicle trip levels similar to or less than existing conditions, area-source emissions from landscaping equipment similar to existing conditions (Table 3.11-7), and no stationary sources. Refer to Impact 3.11-2 (Alt. 2) and Table 3.11-7 for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-3 (Alt. 3)	**Long-Term Operational (Local) Emissions of Carbon Monoxide by Mobile Sources.** *Long-term local emissions of CO from mobile sources related to project operations under Alternative 3 would not violate an air quality standard (i.e., the 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This impact would be **less than significant**.*

This impact is similar to Impact 3.11-3 (Alt. 2), as in Alternative 2, Alternative 3 would not affect current LOS designations. Unlike Alternative 2, Alternative 3 would result in reduced vehicle trips compared with baseline conditions on the existing roadway network and would create even less CO emissions than Alternative 2. Refer to Impact 3.11-3 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-4 (Alt. 3)	**Exposure of Sensitive Receptors to Odors.** *Neither construction nor operation of Alternative 3 would create objectionable odors affecting a substantial number of people. This impact would be **less than significant**.*

This impact is identical to Impact 3.11-4 (Alt. 2). Implementation of Alternative 3 would not result in any major sources of odor, and the project's proposed land use type is not one of the types commonly known to generate odors (e.g., landfill, coffee roaster, wastewater treatment plant). Emissions of diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and the exhaust would dissipate rapidly from the source. Thus, neither construction nor operation of Alternative 3 would create objectionable odors affecting a substantial number of people. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.11-5 (Alt. 3)	**Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Neither construction nor operation of Alternative 3 would result in the exposure of sensitive receptors to substantial emissions of HAPs (TACs). As a result, this impact would be **less than significant**.*

This impact is similar to Impact 3.11-5 (Alt. 2). Because off-road heavy-duty diesel equipment would be used only temporarily and because of the highly dispersive properties of diesel PM (Zhu et al. 2002) and future reductions in exhaust emissions, construction under Alternative 3 would not expose sensitive receptors to substantial emissions of HAPs. No major stationary sources of HAP emissions would be constructed or operated with long-term operation of Alternative 3, nor would implementing this alternative result in the generation of HAP emissions from on-site mobile sources (e.g., diesel truck traffic). Refer to Impact 3.11-5 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.11-1 (Alt. 4)	**Short-Term Emissions of Criteria Air Pollutants and Precursors during Construction.** *Construction-related emissions of criteria air pollutants and precursors under Alternative 4 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This impact would be **significant**.*

As described under Impact 3.11-1 (Alt. 2), construction emissions of fugitive PM_{10} dust, ROG, and NO_X have the potential to represent a significant short-term impact with respect to air quality. Under Alternative 4, the restoration phases of construction would temporarily generate emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from excavation, grading, and clearing; use of off-road equipment; import and export of materials; and workers traveling to and from the project site. Modeling was conducted using the same protocol as described under Alternative 2.

The modeled maximum daily construction-related emissions are summarized in Table 3.11-9 and described in more detail below and in Appendix I, "Air Quality Modeling Results."

Table 3.11-9
Summary of Daily Short-Term Construction-Related Emissions under Alternative 4[1]

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 1 (May 2012–October 2012)			
Fugitive Dust	–	–	77.8
Off-Road Diesel	6.9	54.3	3.0
On-Road Diesel	2.8	45.2	1.6
Worker Trips	0.3	0.5	0.0
Maximum Daily Total, Unmitigated	*10.0*	*100.1*	*82.4*
Maximum Daily Total, Mitigated	*9.5*	*80.1*	*20.6*
Phase 2 (May 2013–October 2013)			
Fugitive Dust	–	–	85.2
Off-Road Diesel	5.3	41.7	2.1
On-Road Diesel	2.3	35.1	1.2
Worker Trips	0.2	0.4	0.0
Maximum Daily Total, Unmitigated	*7.8*	*77.1*	*88.5*
Maximum Daily Total, Mitigated	*7.4*	*61.7*	*22.1*

Notes: NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases.
See Appendix I, "Air Quality Modeling Results," for modeling results.
[1] On-site emissions from mobile equipment used for site grading were based on default emission factors and durations of URBEMIS 2007, Version 9.2.4. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with Section 62.4.A of the Tahoe Regional Planning Agency (TRPA) Code of Ordinances unless special approval has been granted by TRPA.
Source: Modeling performed by EDAW (now AECOM) in 2009

Based on the modeling conducted, construction of Alternative 4 would result in maximum unmitigated daily emissions of approximately 10 lb/day of ROG, 100 lb/day of NO_X, and 82 lb/day of PM_{10} (Table 3.11-9). Daily unmitigated, construction-related emissions would exceed EDCAQMD's short-term significance criterion of 82 lb/day for NO_X.

Construction-related emissions of PM_{10} under Alternative 4 could violate or contribute substantially to an existing or projected air quality violation. Such emissions could expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., the 1-hour ozone and visibility-reducing particulate standards). As a result, this impact would be significant.

Mitigation Measure 3.11-1 (Alt. 4): Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}.

This mitigation measure is identical to Mitigation Measure 3.11-1 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.11-1 (Alt. 4), Impact 3.11-1 (Alt. 4) would be less than significant with mitigation.

IMPACT 3.11-2 (Alt. 4)

Long-Term Operational (Regional) Emissions of Criteria Air Pollutants and Precursors. *Long-term operational emissions would not exceed TRPA's significance criteria for stationary sources or the EDCAQMD significance criterion for mass emissions of ROG and NO_X. Therefore, implementation of Alternative 4 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.11-2 (Alt. 2). Alternative 4 would have vehicle trip levels similar to existing conditions, area-source emissions from landscaping equipment similar to existing conditions (Table 3.11-7), and no stationary sources. Refer to Impact 3.11-2 (Alt. 2) and Table 3.11-7 for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-3 (Alt. 4)

Long-Term Operational (Local) Emissions of Carbon Monoxide by Mobile Sources. *Long-term local emissions of CO from mobile sources related to project operation under Alternative 4 would not violate an air quality standard (i.e., the 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.11-3 (Alt. 2), as in Alternative 2, Alternative 4 would not affect current LOS designations. Unlike Alternative 2, Alternative 4 would result in reduced vehicle trips compared with baseline conditions on the existing roadway network and would create even less CO emissions than Alternative 2. Alternative 4 would have vehicle trip levels similar to existing conditions and would not affect current LOS designations on the existing roadway network. Refer to Impact 3.11-3 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-4 (Alt. 4)

Exposure of Sensitive Receptors to Odors. *Neither construction nor operation of Alternative 4 would create objectionable odors affecting a substantial number of people. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.11-4 (Alt. 2). Implementation of Alternative 4 would not result in any major sources of odor, and the project's proposed land use type is not one of the types commonly known to generate odors (e.g., landfill, coffee roaster, wastewater treatment plant). Emissions of diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and the exhaust would dissipate rapidly from the source. Thus, neither construction nor operation of Alternative 4 would create objectionable odors affecting a substantial number of people. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.11-5 (Alt. 4)

Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants. *Neither construction nor operation of Alternative 4 would result in the exposure of sensitive receptors to substantial emissions of HAPs (TACs). As a result, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.11-5 (Alt. 2). Because off-road heavy-duty diesel equipment would be used only temporarily and because of the highly dispersive properties of diesel PM (Zhu et al. 2002) and future reductions in exhaust emissions, construction under Alternative 4 would not expose sensitive receptors to substantial emissions of HAPs. No major stationary sources of HAP emissions would be constructed or operated with long-term operation of Alternative 4, nor would implementing this alternative result in the generation of

HAP emissions from on-site mobile sources (e.g., diesel truck traffic). Refer to Impact 3.11-5 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.11-1 (Alt. 5) **Short-Term Emissions of Criteria Air Pollutants and Precursors during Construction.** *Construction-related emissions of criteria air pollutants and precursors under Alternative 5 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This impact would be* ***significant.***

As described under Impact 3.11-1 (Alt. 2), construction emissions of fugitive PM_{10} dust, ROG, and NO_X have the potential to represent a significant short-term impact with respect to air quality. Under Alternative 5, the initial site preparation and building phases of construction would temporarily generate emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from excavation, grading, and clearing; use of off-road equipment; import and export of materials; paving; application of architectural coatings; and workers traveling to and from the project site. Modeling was conducted using the same protocol as described under Alternative 2.

The modeled maximum daily construction-related emissions are summarized in Table 3.11-10 and described in more detail below and in Appendix I, "Air Quality Modeling Results."

Based on the modeling conducted, construction of Alternative 5 would result in maximum unmitigated daily emissions of approximately 7 lb/day of ROG, 58 lb/day of NO_X, and 318 lb/day of PM_{10} (Table 3.11-10).

Table 3.11-10
Summary of Daily Short-Term Construction-Related Emissions under Alternative 5[1]

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 1 (May 2012–October 2012)			
Fugitive Dust	–	–	315.1
Off-Road Diesel	2.4	18.3	1.0
On-Road Diesel	1.1	17.8	0.6
Worker Trips	0.1	0.2	0.0
Maximum Daily Total, Unmitigated	*3.6*	*36.3*	*316.7*
Maximum Daily Total, Mitigated	*3.4*	*29.0*	*79.2*
Phase 2 (May 2013–October 2013)			
Fugitive Dust	–	–	315.1
Off-Road Diesel	5.4	41.7	2.3
On-Road Diesel	1.0	15.7	0.6
Worker Trips	0.2	0.4	0.0
Maximum Daily Total, Unmitigated	*6.6*	*57.8*	*318.0*
Maximum Daily Total, Mitigated	*6.3*	*46.2*	*79.5*

Source	Project-Generated Emissions (pounds per day)		
	ROG	NO_X	PM_{10}
Phase 3 (May 2014–October 2014)			
Fugitive Dust	–	–	192.9
Off-Road Diesel	4.6	35.0	1.8
On-Road Diesel	0.9	13.6	0.5
Worker Trips	0.1	0.3	0.0
Maximum Daily Total, Unmitigated	*5.6*	*48.9*	*195.2*
Maximum Daily Total, Mitigated	*5.3*	*39.1*	*48.8*

Table 3.11-10
Summary of Daily Short-Term Construction-Related Emissions under Alternative 5[1]

Notes: NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases.
See Appendix I, “Air Quality Modeling Results,” for modeling results.
[1] On-site emissions from mobile equipment used for site grading were based on default emission factors and durations of URBEMIS 2007, Version 9.2.4. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with Section 62.4.A of the Tahoe Regional Planning Agency (TRPA) Code of Ordinances unless special approval has been granted by TRPA.
Source: Modeling performed by EDAW (now AECOM) in 2009

Construction-related emissions of PM_{10} under Alternative 5 could violate or contribute substantially to an existing or projected air quality violation. Such emissions could expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., the 1-hour ozone and visibility-reducing particulate standards). As a result, this impact would be significant.

Mitigation Measure 3.11-1 (Alt. 5): Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}.

This mitigation measure is identical to Mitigation Measure 3.11-1 (Alt. 2).

This mitigation measure is identical to Mitigation Measure 3.11-1 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.11-1 (Alt. 5), Impact 3.11-1 (Alt. 5) would be less than significant with mitigation.

IMPACT 3.11-2 (Alt. 5)

Long-Term Operational Emissions of Criteria Air Pollutants and Precursors. *Long-term operational emissions would not exceed TRPA’s significance criteria for stationary sources or the EDCAQMD significance criterion for mass emissions of ROG and NO_X. Therefore, implementation of Alternative 5 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.11-2 (Alt. 3), as Alternative 3, no increase in vehicle trips or other operational emissions would occur. Alternative 5 would remove almost all vehicle trips associated with operation of the golf course and remove all area-source emissions from landscaping equipment (Table 3.11-7), and the alternative would have no stationary sources. Refer to Impact 3.11-2 (Alt. 2) and Table 3.11-7 for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-3 (Alt. 5) **Long-Term Operational (Local) Emissions of Carbon Monoxide by Mobile Sources.** *Long-term local emissions of CO from mobile sources related to project operation under Alternative 5 would not violate an air quality standard (i.e., the 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.11-3 (Alt. 2), as in Alternative 2, Alternative 5 would not affect current LOS designations. Unlike Alternative 2, Alternative 5 would result in reduced vehicle trips compared with baseline conditions on the existing roadway network and would create even less CO emissions than Alternative 2. Refer to Impact 3.11-3 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

IMPACT 3.11-4 (Alt. 5) **Exposure of Sensitive Receptors to Odors.** *Neither construction nor operation of Alternative 5 would create objectionable odors affecting a substantial number of people. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.11-4 (Alt. 2). Implementation of Alternative 5 would not result in any major sources of odor, and the project's proposed land use type is not one of the types commonly known to generate odors (e.g., landfill, coffee roaster, wastewater treatment plant). Emissions of diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and the exhaust would dissipate rapidly from the source. Thus, neither construction nor operation of Alternative 5 would create objectionable odors affecting a substantial number of people. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.11-5 (Alt. 5) **Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Neither construction nor operation of Alternative 5 would result in the exposure of sensitive receptors to substantial emissions of HAPs (TACs). As a result, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.11-5 (Alt. 2). Because off-road heavy-duty diesel equipment would be used only temporarily and because of the highly dispersive properties of diesel PM (Zhu et al. 2002) and future reductions in exhaust emissions, construction under Alternative 5 would not expose sensitive receptors to substantial emissions of HAPs. No major stationary sources of HAP emissions would be constructed or operated with long-term operation of Alternative 5, nor would implementing this alternative result in the generation of HAP emissions from on-site mobile sources (e.g., diesel truck traffic). Refer to Impact 3.11-5 (Alt. 2) for a more detailed discussion. This impact would be less than significant.

No mitigation is required.

3.12 NOISE

This section includes a description of applicable noise regulations acoustic fundamentals, existing ambient noise conditions, and an analysis of potential short- and long-term noise impacts associated with implementation of Alternatives 1–5. Mitigation measures are recommended, as necessary, to reduce potentially significant adverse noise impacts. The information contained in this section is based in part on documents prepared by TRPA and El Dorado County. Consistency with TRPA goals and policies is presented in Section 3.2, “Land Use,” Table 3.2-1. Cumulative noise impacts are addressed in Section 3.16, “Cumulative Impacts.” The project effects on thresholds are described in Chapter 4, Section 4.6, “Consequences for Environmental Threshold.”

3.12.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

U.S. Department of Transportation

To address the human response to groundborne vibration, the Federal Transit Administration (FTA) of the U.S. Department of Transportation (DOT) has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. Among these guidelines are the following (FTA 2006):

- 65 velocity decibels (VdB), referenced to 1 microinch per second (μin/sec) and based on the root mean square (RMS) velocity amplitude, for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities)
- 80 VdB for residential uses and buildings where people normally sleep
- 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices) (FTA 2006).

Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) at the request of the U.S. Environmental Protection Agency (EPA) (FTA 2006:Chapters 10 and 12). For fragile structures, a maximum limit of 0.25 inch per second (in/sec) peak particle velocity (PPV) is recommended (FTA 2006: Chapters 10 and 12).

State

The California Governor’s Office of Planning and Research (OPR) published the *State of California General Plan Guidelines* (OPR 2003), which provides guidance for the acceptability of projects within specific community noise equivalent level (CNEL) contours (see “Noise Descriptors” in Section 3.12.2, “Affected Environment,” below). Table 3.12-1 summarizes acceptable and unacceptable community-noise-exposure limits for various land use categories. Generally, residential uses are considered to be acceptable in areas where exterior noise levels do not exceed a CNEL of 60 A-weighted decibels (dBA). Residential uses are normally unacceptable in areas exceeding 70 dBA CNEL and conditionally acceptable within 55–70 dBA CNEL. Schools are normally acceptable in areas up to 70 dBA CNEL and normally unacceptable in areas exceeding 70 dBA CNEL. Commercial uses are normally acceptable in areas up to 70 dBA CNEL. Between 67.5 and 77.5 dBA CNEL, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise-acceptability standards that reflect the particular community’s noise-control goals, sensitivity to noise, and assessment of the relative importance of noise issues.

Table 3.12-1 California Land Use Noise Compatibility Guidelines				
Land Use Category	Community Noise Exposure (CNEL or L_{dn}, dBA)			
	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Residential—Low-Density Single-Family, Duplex, Mobile Home	< 60	55–70	70–75	75+
Residential—Multi-Family	< 65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	< 65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	< 70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters		< 70	65+	
Sports Arena, Outdoor Spectator Sports		< 75	70+	
Playgrounds, Neighborhood Parks	< 70		67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	< 75		70–80	80+
Office Building, Business Commercial, and Professional	< 70	67.5–77.5	75+	
Industrial, Manufacturing, Utilities, Agriculture	< 75	70–80	75+	

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night noise level

a Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

b New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

c New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

d New construction or development should generally not be undertaken.

Source: OPR 2003

Tahoe Regional Planning Agency

The Regional Plan for the Tahoe Basin is a progressive plan and includes the following provisions related to noise: Goals and Policies (i.e., noise subelement) (TRPA 2003), Plan Area Statements (PAS) (TRPA 2002a), and Code of Ordinances (i.e., Chapter 23, Noise Limitations) (TRPA 2004). These documents are described separately below. The Regional Plan also includes environmental threshold carrying capacities (thresholds) for noise (TRPA 2002b, 2007a), which are discussed below.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The Goals and Policies document presents the overall approach to meeting the thresholds for noise. Refer to Tables 3.12-2 and 3.12-3 for TRPA noise thresholds.

Table 3.12-2
TRPA Environmental Threshold Carrying Capacity
Noise Standards for Single Events (L_{max})

Single Event	Threshold
Aircraft	*Departures (all aircraft):* 80 dBA at 6,500 m from start to takeoff roll. 77.1 dBA at 6,500 m from start to takeoff roll between 8 p.m. and 8 a.m. *Arrivals:* 84 dBA at 2,000 m from the runway threshold approach (general aviation and commuter aircraft). 86 dBA at 2,000 m from the runway threshold approach (transport category aircraft). 77.1 dBA (all aircraft) 2,000 m from the runway threshold approach between 8 p.m. and 8 a.m.
Watercraft	82.0 dBA at 50 feet with the engine operating at 3,000 rotations per minute.
Motor Vehicles	< 6,000 lb GVW: 76.0 dBA at 50 feet (< 35 mph), 82.0 dBA at 50 feet (> 35 mph). > 6,000 lb GVW: 82.0 dBA at 50 feet (< 35 mph), 86.0 dBA at 50 feet (> 35 mph).
Motorcycles	77.0 dBA at 50 feet (< 35 mph). 86.0 dBA at 50 feet (> 35 mph).
Off-Road Vehicles	72.0 dBA at 50 feet (< 35 mph). 86.0 dBA at 50 feet (> 35 mph).
Over-Snow Vehicles (snowmobiles)	82.0 dBA at 50 feet.

Notes: dBA = A-weighted decibels; GVW = gross vehicle weight; lb = pounds; L_{max} = maximum noise level; m = meters; mph = miles per hour
Source: TRPA 2007a: 9-3,4

Table 3.12-3
TRPA Environmental Threshold Carrying Capacity Noise Standards

Land Use Category	Maximum Average Noise Level or CNEL Range for Background Noise Levels (dBA)
High Density Residential	55
Low Density Residential	50
Hotel	60
Commercial	60
Industrial	65
Urban Outdoor Recreation	55
Rural Outdoor Recreation	50
Wilderness and Roadless	45
Critical Wildlife Habitat	45

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels
Source: TRPA 2007a: 9-3,4

The noise subelement of the Goals and Policies document contains the following applicable goals and policies:

GOAL 1: Single Event Noise Standards Shall Be Attained and Maintained. People can be annoyed by a specific noise source. Thresholds were adopted that apply to aircraft, boats, motor vehicles, off-road vehicles, and snowmobiles to reduce impacts associated with single noise events.

- **Policies:**

  1. An ordinance and enforcement program shall be developed to permit only aircraft that meet the single event noise thresholds to use the airport.

  2. Boats will only be allowed to use Lake Tahoe if they comply with the single-event threshold.

  3. Motor vehicles and motorcycles shall comply with the appropriate noise thresholds.

  4. Off-road vehicle use is prohibited in the Lake Tahoe Basin except on specified roads, trails, or designated areas where the impacts can be mitigated.

  5. The use of snowmobiles will be restricted to designated areas.

  6. The plan will permit uses only if they are consistent with the noise standards. Sound proofing practices may be required on all structures containing uses that would otherwise adversely impact the prescribed noise levels.

GOAL 2: Community Noise Equivalent Levels Shall Be Attained and Maintained. CNEL thresholds were adopted to reduce the annoyance associated with cumulative noise events on people and wildlife. In the Lake Tahoe Basin, the main sources of noise are attributed to the major transportation corridors and the airport. Therefore, the policies are directed towards reducing the transmission of noise from those sources. The CNEL thresholds will be attained upon implementation of the following policies.

- **Policies:**

  1. Transmission of noise from transportation corridors shall be reduced.

     The noise associated with the transportation corridors can be decreased by reducing the number of trips and by installing mitigation measures. Trip reduction will be accomplished by the transit improvements identified in the Transportation Element. Ordinances will establish specific site design criteria for projects to help reduce the transmission of noise from the transportation corridors. The design criteria will also be incorporated into the water quality and transportation improvement programs. The mitigation measures may include set backs, earth berms, and barriers.

  2. Reduce noise-related impacts associated with the airport to acceptable levels.

  3. TRPA will further define CNELs for wilderness and roadless areas, and for critical wildlife habitat areas.

The noise subelement has also established the following CNEL values for transportation corridors:

- U.S. Highway 50 (U.S. 50)—65 dBA
- State Routes 89, 207, 28, 267, and 431—55 dBA
- South Lake Tahoe Airport—60 dBA

The highway CNEL values override the land use–based CNELs and are limited to an area within 300 feet from the edge of the road. The airport CNEL value applies to areas affected by the approved flight plans.

Code of Ordinances

Chapter 23, “Noise Limitations,” of the TRPA Code of Ordinances establishes noise limitations for single noise events from aircraft, marine craft, motor vehicles, motorcycles, off-road vehicles, and oversnow vehicles (TRPA 2004). Section 23.2 states that TRPA shall use the maximum level recorded on a noise meter, L_{max} (see “Noise Descriptors” below), for measuring single noise events. The noise levels set forth in Subsection 23.2.A are the maximum permissible noise levels for the types of operations listed, unless specifically exempted under Section 23.8. Section 23.3 also states that TRPA shall use CNELs to measure community noise levels. The PASs shall set forth CNELs that shall not be exceeded by any one activity or combination of activities. In addition, CNELs shall not exceed levels existing on August 26, 1982, where such levels are known. The CNELs set forth in the PASs are based on the land use classification, the presence of transportation corridors, and the applicable threshold.

Chapter 23 also provides guidance on the measurement of noise levels (Section 23.4), noise monitoring (Section 23.5), and performance standards (Section 23.6). The noise limitations established in Chapter 23 of the TRPA Code of Ordinances do not apply to noise from TRPA-approved construction or maintenance projects, or the demolition of structures, provided that such activities are limited to the hours between 8:00 a.m. and 6:30 p.m.

Plan Area Statements

The lowest maximum CNEL included as the noise standard for the applicable PASs is 50 dBA CNEL (in PAS 120, 124, 132, 133, and 134, which cover the residential neighborhoods surrounding Washoe Meadows SP and Lake Valley SRA). The maximum CNEL for the study area is 55 dBA CNEL (PAS 119). The maximum CNEL for the U.S. 50 corridor is 65 dBA CNEL. The maximum CNEL from aircraft flight paths is 60 dBA CNEL in PAS 100.

Environmental Threshold Carrying Capacities

As required by the bi-State compact, TRPA has adopted thresholds for the Lake Tahoe region. The thresholds for noise are numerical CNEL values for various land use categories and transportation corridors, and single-event L_{max} standards for specific sources (motor vehicles, off-road vehicles, boats, snowmobiles, and aircraft). Table 3.12-2 above summarizes the thresholds for single events (L_{max}) and Table 3.12-3 above summarizes the thresholds for community noise events. In addition to these, the thresholds also contain the following policy statement:

> It shall be the policy of the TRPA Governing Board in the development of the Regional Plan to define, locate, and establish CNEL levels for transportation corridors.

El Dorado County

El Dorado County General Plan Noise Element

Although El Dorado County does not have authority over state lands, County policies and standards are important to understand for impact analysis. The Noise Element of the *El Dorado County General Plan* contains the following goals, objectives, policies, and criteria (El Dorado County 2004: Chapter 6):

GOAL 6.5: Acceptable Noise Levels. Ensure that County residents are not subjected to noise beyond acceptable levels.

Objective 6.5.1: Protection of Noise-Sensitive Development. Protect existing noise-sensitive developments (e.g., hospitals, schools, churches and residential) from new uses that would generate noise levels incompatible with those uses and, conversely, discourage noise-sensitive uses from locating near sources of high noise levels.

- **Policy 6.5.1.1:** Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table [3.12-4] or the performance standards of Table [3.12-5], an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Table 3.12-4
Maximum Allowable Noise Exposure for Transportation Noise Sources

Land Use	Outdoor Activity Areas[a] L_{dn}/CNEL, dBA	Interior Spaces	
		L_{dn}/CNEL, dBA	L_{eq}, dB[b]
Residential	60[c]	45	–
Transient Lodging	60[c]	45	–
Hospitals, Nursing Homes	60[c]	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Churches, Meeting Halls, Schools	60[c]	–	40
Office Buildings	–	–	45
Libraries, Museums	–	–	45
Playgrounds, Neighborhood Parks	70	–	45

Notes: CNEL = community noise equivalent level; dB = decibels; dBA = A-weighted decibels; L_{dn} = day-night noise level; L_{eq} = equivalent noise level

[a] In Communities and Rural Centers, where the location of outdoor activity areas is not clearly defined, the exterior noise level standard shall be applied to the property line of the receiving land use. For residential uses with front yards facing the identified noise source, an exterior noise level criterion of 65 dB L_{dn} shall be applied at the building façade, in addition to a 60 dB L_{dn} criterion at the outdoor activity area. In Rural Regions, an exterior noise level criterion of 60 dB L_{dn} shall be applied at a 100-foot radius from the residence unless it is within Platted Lands where the underlying land use designation is consistent with the Community Region densities in which case the 65 dB L_{dn} may apply. The 100-foot radius applies to properties which are five acres and larger; the balance will fall under the property line requirement.

[b] As determined for a typical worst-case hour during periods of use.

[c] Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Source: El Dorado County 2004

- **Policy 6.5.1.2:** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table [3.12-4] at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

- **Policy 6.5.1.3:** Where noise mitigation measures are required to achieve the standards of Tables [3.12-4 and 3.12-5], the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project and the noise barriers are not incompatible with the surroundings.

Table 3.12-5 Noise Level Performance Protection Standards for Noise-Sensitive Land Uses Affected by Nontransportation* Sources						
Noise Level Descriptor	Daytime 7 a.m.–7 p.m.		Evening 7 p.m.–10 p.m.		Night 10 p.m.–7 a.m.	
	Community	Rural	Community	Rural	Community	Rural
Hourly L_{eq}, dBA	55	50	50	45	45	40
Maximum Level, dBA	70	60	60	55	55	50

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level

Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

The County can impose noise level standards up to 5 dB less than those specified above based upon determination of existing low ambient noise levels in the vicinity of the project site.

In Community areas the exterior noise level standard shall be applied to the property line of the receiving property. In Rural Areas the exterior noise level standard shall be applied at a point 100 feet away from the residence. The above standards shall be measured only on property containing a noise sensitive land use as defined in Objective 6.5.1. This measurement standard may be amended to provide for measurement at the boundary of a recorded noise easement between all affected property owners and approved by the County.

* For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Control of noise from facilities of regulated public facilities is preempted by California Public Utilities Commission (CPUC) regulations. All other noise sources are subject to local regulations. Nontransportation noise sources may include industrial operations; outdoor recreation facilities; heating, ventilation, and air conditioning (HVAC) units; schools; hospitals; commercial land uses; other outdoor land use, etc.

Source: El Dorado County 2004

- **Policy 6.5.1.4:** Existing dwellings and new single-family dwellings on legal lots of record, as of the date of adoption of this General Plan, are not subject to County review with respect to satisfaction of the standards of the Public Health, Safety, and Noise Element except in areas governed by the Comprehensive Land Use Plans for applicable airports. (See Objective 6.5.2.) As a consequence, such dwellings may be constructed in other areas where noise levels exceed the standards of the Public Health, Safety, and Noise Element. It is not the responsibility of the County to ensure that such dwellings meet the noise standards of the Public Health, Safety, and Noise Element, or the noise standards imposed by lending agencies such as HUD [U.S. Department of Housing and Urban Development], FHA [Federal Housing Administration], and Cal Vet [California Department of Veterans Affairs]. If homes are located and constructed in accordance with the Public Health, Safety, and Noise Element, it is expected that the resulting exterior and interior noise levels will conform to the HUD/FHA/Cal Vet noise standards.

- **Policy 6.5.1.5:** Setbacks shall be the preferred method of noise abatement for residential projects located along U.S. Highway 50. Noise walls shall be discouraged within the foreground viewshed of U.S. Highway 50 and shall be discouraged in favor of less intrusive noise mitigation (e.g., landscaped berms, setbacks) along other high volume roadways.

- **Policy 6.5.1.6:** New noise-sensitive uses shall not be allowed where the noise level, due to non-transportation noise sources, will exceed the noise level standards of Table [3.12-5] unless effective noise mitigation measures have been incorporated into the development design to achieve those standards.

- **Policy 6.5.1.7:** Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table [3.12-5] for noise-sensitive uses.

- **Policy 6.5.1.8:** New development of noise sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in

Table [3.12-4] unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table [3.12-5].

- **Policy 6.5.1.9:** Noise created by new transportation noise sources, excluding airport expansion but including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table [3.12-4] at existing noise-sensitive land uses.

- **Policy 6.5.1.10:** To provide a comprehensive approach to noise control, the County shall:

  A. Develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the project review process and, as may be determined necessary, through the building permit process.

  B. Develop and employ procedures to monitor compliance with the standards of the Noise Element after completion of projects where noise mitigation measures were required.

  C. The zoning ordinance shall be amended to provide that noise standards will be applied to ministerial projects with the exception of single-family residential building permits if not in areas governed by the Airports Comprehensive Land Use Plans (CLUP). (See Objective 6.5.2.)

- **Policy 6.5.1.11:** The standards outlined in Tables [3.12-6, 3.12-7, and 3.12-8] shall apply to those activities associated with actual construction of a project as long as such construction occurs between the hours of 7 a.m. and 7 p.m., Monday through Friday, and 8 a.m. and 5 p.m. on weekends, and on Federally recognized holidays. Exceptions are allowed if it can be shown that construction beyond these times is necessary to alleviate traffic congestion and safety hazards.

Table 3.12-6
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Community Regions and Adopted Plan Areas—Construction Noise

Land Use Designation[1]	Time Period	Noise Level (dBA)	
		L_{eq}	L_{max}
Higher-Density Residential (MFR, HDR, MDR)	7 a.m.–7 p.m. 7 p.m.–10 p.m. 10 p.m.–7 a.m.	55 50 45	75 65 60
Commercial and Public Facilities (C, R&D, PF)	7 a.m.–7 p.m. 7 p.m.–7 a.m.	70 65	90 75
Industrial (I)	Any Time	80	90

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level

[1] Adopted plan areas should refer to those land use designations that most closely correspond to the similar General Plan land use designations for similar development.

Source: El Dorado County 2004

- **Policy 6.5.1.12:** When determining the significance of impacts and appropriate mitigation for new development projects, the following criteria shall be taken into consideration.

  A. Where existing or projected future traffic noise levels are less than 60 dBA L_{dn} [day-night noise level] at the outdoor activity areas of residential uses, an increase of more than 5 dBA L_{dn} caused by a new transportation noise source will be considered significant;

Table 3.12-7
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Rural Centers—Construction Noise

Land Use Designation[1]	Time Period	Noise Level (dBA) L_{eq}	Noise Level (dBA) L_{max}
Higher-Density Residential (MFR, HDR, MDR)	7 a.m.–7 p.m. 7 p.m.–10 p.m. 10 p.m.–7 a.m.	55 50 40	75 65 55
Commercial and Public Facilities (C, R&D, PF)	7 a.m.–7 p.m. 7 p.m.–7 a.m.	65 60	75 70
Industrial (I)	Any Time	70	80
Open Space (OS)	7 a.m.–7 p.m. 7 p.m.–7 a.m.	55 50	75 65

Note: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level
[1] Adopted plan areas should refer to those land use designations that most closely correspond to the similar General Plan land use designations for similar development.
Source: El Dorado County 2004

Table 3.12-8
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Rural Regions—Construction Noise

Land Use Designation[1]	Time Period	Noise Level (dBA) L_{eq}	Noise Level (dBA) L_{max}
All Residential (LDR)	7 a.m.–7 p.m. 7 p.m.–10 p.m. 10 p.m.–7 a.m.	50 45 40	60 55 50
Commercial and Public Facilities (C, R&D, PF)	7 a.m.–7 p.m. 7 p.m.–7 a.m.	65 60	75 70
Rural Land, Natural Resources, Open Space, and Agricultural Lands (RR, NR, OS, AL)	7 a.m.–7 p.m. 7 p.m.–7 a.m.	55 50	75 65

Note: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level
[1] Adopted plan areas should refer to those land use designations that most closely correspond to the similar General Plan land use designations for similar development.
Source: El Dorado County 2004

B. Where existing or projected future traffic noise levels range between 60 and 65 dBA L_{dn} at the outdoor activity areas of residential uses, an increase of more than 3 dBA L_{dn} caused by a new transportation noise source will be considered significant; and

C. Where existing or projected future traffic noise levels are greater than 65 dBA L_{dn} at the outdoor activity areas of residential uses, an increase of more than 1.5 dBA L_{dn} caused by a new transportation noise will be considered significant.

- **Policy 6.5.1.13:** When determining the significance of impacts and appropriate mitigation to reduce those impacts for new development projects, including ministerial development, the following criteria shall be taken into consideration:

A. In areas in which ambient noise levels are in accordance with the standards in Table [3.12-5], increases in ambient noise levels caused by new non-transportation noise sources that exceed 5 dBA shall be considered significant; and

B. In areas in which ambient noise levels are not in accordance with the standards in Table [3.12-5], increases in ambient noise levels caused by new non-transportation noise sources that exceed 3 dBA shall be considered significant.

- **Policy 6.5.1.14:** The County will adopt a noise ordinance to resolve neighborhood conflicts and to control unnecessary noise in the County. Examples of the types of noise sources that can be controlled through the use of a quantitative noise ordinance include noisy mechanical equipment (e.g., swimming pool pumps, HVAC [heating, ventilation, air conditioning] units), and amplified music in commercial establishments.

- **Policy 6.5.1.15:** The County will establish and maintain coordination among city, county, and state agencies involved in noise abatement and other agencies to reduce noise generated from sources outside the County's jurisdiction.

Objective 6.5.2: Airport Noise Guidelines. The County shall recognize the CLUPs for the Placerville Airport, the Cameron Airpark Airport, the Georgetown Airport, and the City of South Lake Tahoe Airport as the applicable guidelines for development within the 55 dB L_{dn}/CNEL contour of these airports. Where there is a conflict between the County noise standards and the noise standards of the CLUP, the standards of the CLUP shall take precedence.

- **Policy 6.5.2.1:** All projects, including single-family residential, within the 55 dB/CNEL contour of a County airport shall be evaluated against the noise guidelines and policies in the applicable CLUP.

- **Policy 6.5.2.2:** The County shall develop and apply a combining zone district for areas located within the 55 dB/CNEL contour of airports.

- **Policy 6.5.2.3:** All airports which have not developed noise level contours consistent with the El Dorado County General Plan forecast year of 2025 should update the respective Master Plans and CLUP to reflect aircraft operation noise levels in the year 2025.

El Dorado County Noise Ordinance

The following section of Chapter 9.16, "Noise," of the El Dorado County Code (El Dorado County 1988: Chapter 9.16) is applicable to the project.

9.16.050 Loud and Raucous Noises—Prohibited.

Except as otherwise provided in this chapter, it is unlawful for any person to willfully make, emit, or transmit or cause to be made, emitted, or transmitted any loud and raucous noise upon or from any public highway or public thoroughfare or from any aircraft of any kind whatsoever, or from any public or private property to such an extent that it unreasonably interferes with the peace and quiet of another's private property. (Ord. 3189 Section 1(part), 1981: prior code Section 7582)

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration, and as any pressure variation in air that the human ear can detect.

Sound Characteristics

Frequency, wavelength, and amplitude are characteristics typically used to describe sound. Sound is in the form of a sinusoidal longitudinal wave. Amplitude is defined as the maximum positive displacement from the undisturbed position of the medium to the top of the wave (crest). The amplitude of the wave determines the loudness of the sound. The frequency is determined by the number of wave cycles per second. The frequency is used to describe the pitch of the sound and is the reciprocal of the wave period, which is defined as the duration of one cycle. The wavelength is the distance between two successive crests. An inverse relationship exists between frequency and wavelength; thus, as frequency increases, wavelength shortens and vice versa (Caltrans 1998: N-2131).

Sound and the Human Ear

Because the human ear can detect a wide range of sound pressure fluctuations, sound pressure levels are expressed in logarithmic units called decibels (dB). The sound pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold (Caltrans 1998: N-2132).

Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. An A-weighted decibel scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most authorities for regulation of the noise environment. Typical indoor and outdoor noise levels are presented in Exhibit 3.12-1.

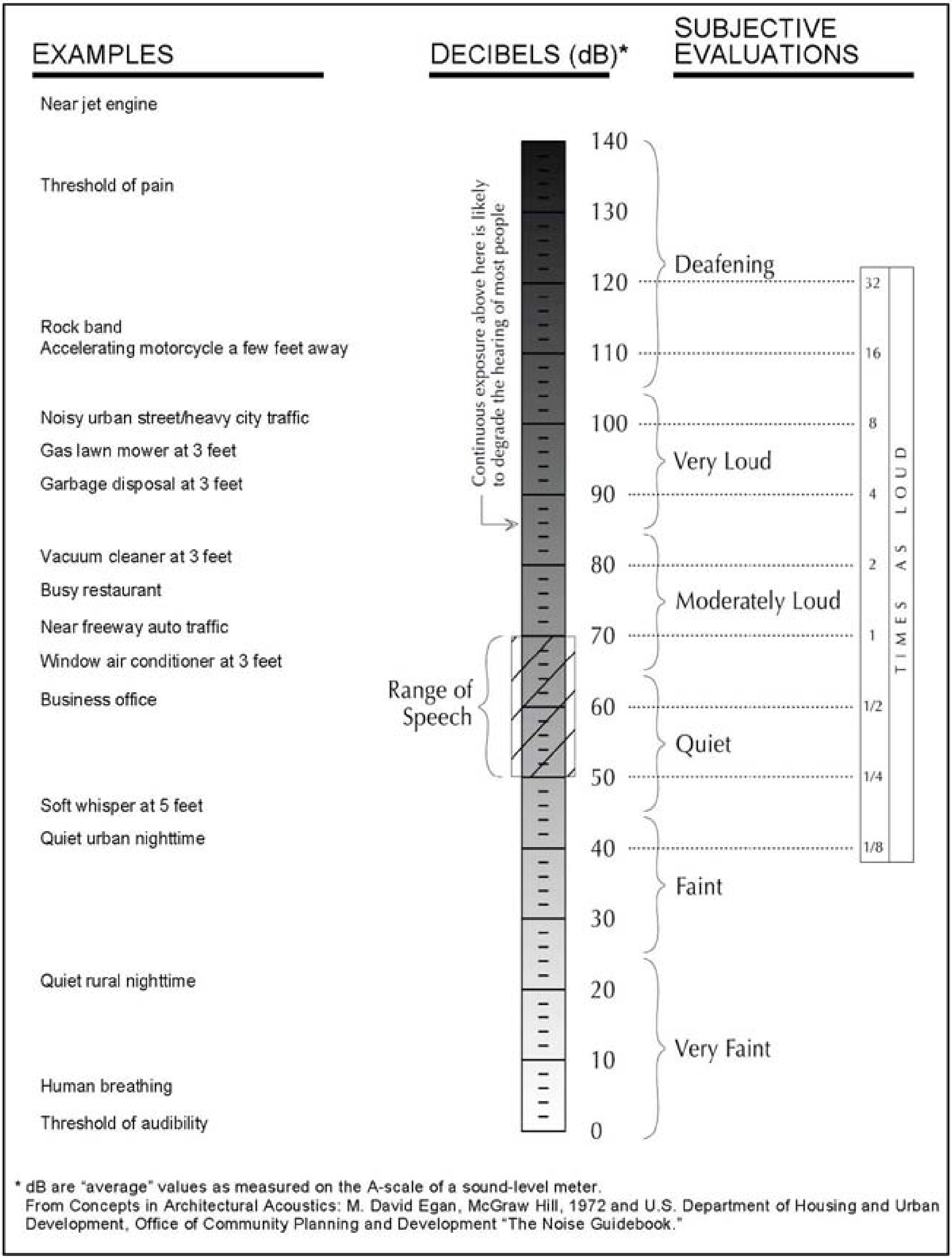
As indicated, typical sounds range from 40 dBA (very quiet) to 100 dBA (very loud). Conversation is roughly 60 dBA at 3–5 feet. As background noise levels exceed 60 dBA, speech becomes increasingly difficult to understand. Noise becomes physically discomforting at 110 dBA.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (CalTrans 1998: N-2211), as presented in Table 3.12-9. Table 3.12-9 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50–70 dBA, as this is the usual range of voice and interior noise levels.

Table 3.12-9
Subjective Reaction to Changes in Noise Levels of Similar Sources

Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (except for tones)	1.3
3	Just barely perceptible	2.0
6	Clearly noticeable	4.0
10	About twice (or half) as loud	10.0

Note: dBA = A-weighted decibels
Source: CalTrans 1998: N-2211



Source: Data compiled by EDAW (now AECOM) in 2006

Typical Noise Levels **Exhibit 3.12-1**

Sound Propagation and Attenuation

As sound (noise) propagates from the source to the receptor, the attenuation (manner of noise reduction in relation to distance) depends on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to the receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance. However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Atmospheric conditions such as wind speed, temperature, and humidity may affect noise levels. Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation depends on the size of the barrier and the frequency of the noise. A noise barrier may be any natural or human-made feature such as a hill, tree, building, wall, or berm (Caltrans 1998: N-2144).

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dBA with its windows closed (Veneklasen 1973, cited in Caltrans 2002: 7-37).

Noise Descriptors

The proper noise descriptor selected for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (FTA 2006: 2-21).

- **L_{max} (maximum noise level):** The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the “peak (noise) level.”

- **L_{min} (minimum noise level):** The minimum instantaneous noise level during a specific period of time.

- **L_X (statistical descriptor):** The noise level exceeded X percent of a specific period of time.

- **L_{eq} (equivalent noise level):** The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.

- **L_{dn} (day-night noise level):** The 24-hour L_{eq} with a 10-dBA “penalty” for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dBA is “added” to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

- **CNEL (community noise equivalent level):** A noise level similar to the L_{dn} described above, but with an additional 5-dBA “penalty” added to noise events that occur during the noise-sensitive hours between 7 p.m. and 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. When the same 24-hour noise data are used, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

- **SENL (single-event [impulsive] noise level):** A receiver’s cumulative noise exposure from a single impulsive noise event, which is defined as an acoustical event that is of short duration and involves a change in sound pressure above some reference value. SENLs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 1998: N-2200).

ENVIRONMENTAL SETTING

The study area consists of sections of Washoe Meadows SP and Lake Valley SRA. Washoe Meadows SP consists of a natural area with casual or volunteer trails and unpaved service access roads. Lake Valley SRA is made up of the Lake Tahoe Golf Course and its structures, parking lots, and roadways.

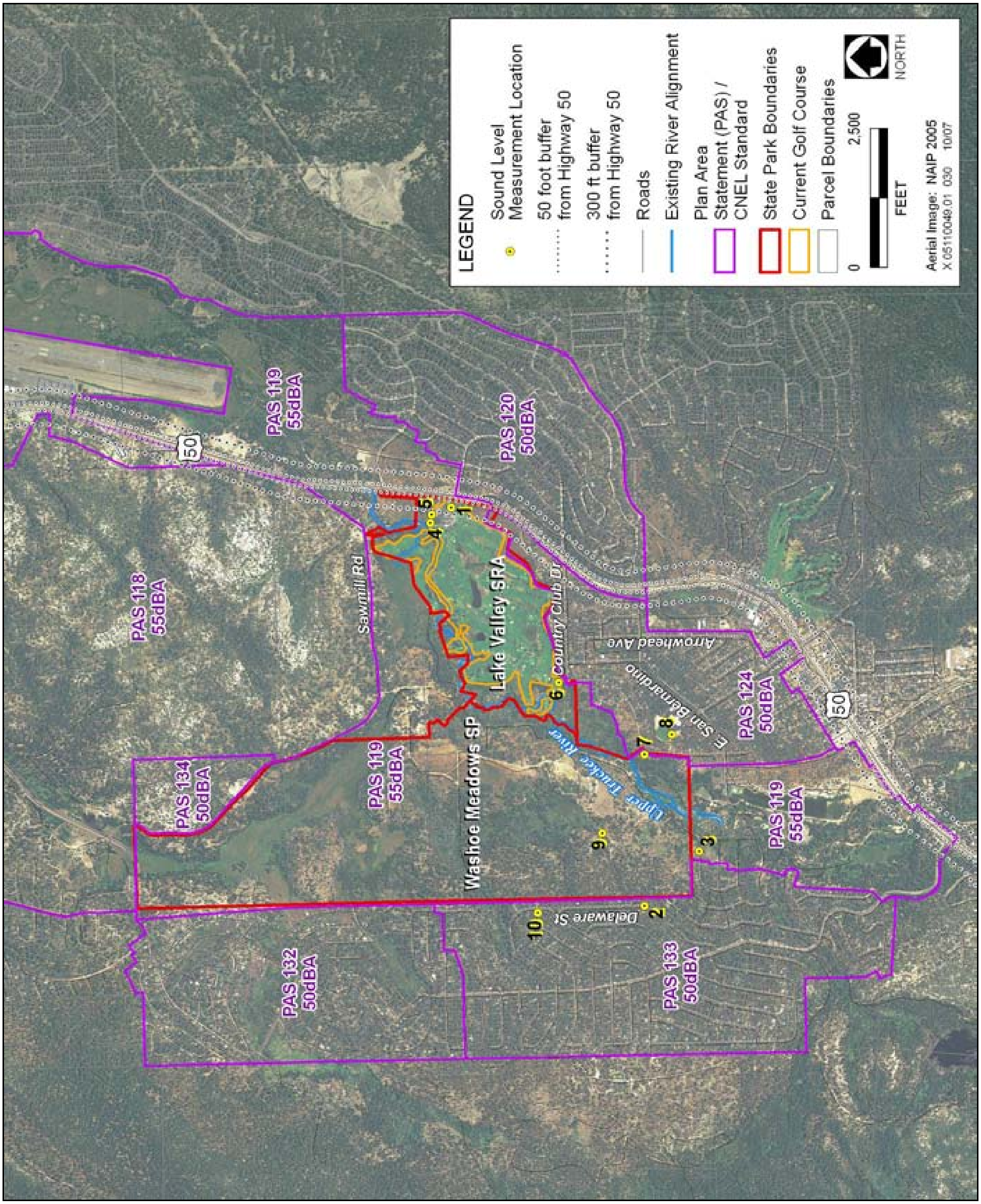
Existing Ambient Noise Survey

Ambient-noise measurements were conducted by EDAW (now AECOM) on October 12, 2006 and November 15, 2008, to document the existing noise environment at various locations within the study area. Refer to Exhibit 3.12-2 for locations of noise level measurements. Short-term noise-level measurements were taken in accordance with the American National Standards Institute's acoustic standards at four locations using a Larson Davis model 820 sound-level meter. The short-term L_{eq}, and L_{max} values for each ambient-noise-measurement location are presented in Table 3.12-10 along with a description of the major noise sources present. Based on the measurements conducted, average daytime noise levels within the study area range in the mid-40s.

As stated above, one of the noise sources within the study area is vehicle traffic on area roadways. Existing traffic noise levels were modeled for U.S. 50 using the Federal Highway Administration's (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108), based on data obtained from the California Department of Transportation (Caltrans). Additional input data included day/evening/night percentages and auto/medium/heavy truck percentages, vehicle speeds, ground attenuation factors, and roadway widths. Table 3.12-11 presents the modeled CNEL noise levels at 50 feet from the edge of the roadway and the distance from the roadway edge to the 55-, 60-, 65-, and 70-dBA CNEL contours for existing average-daily-traffic (ADT) volumes. Actual noise levels vary from day to day, depending on factors such as local traffic volumes, shielding from existing structures, variations in attenuation rates attributable to changes in surface parameters, and meteorological conditions.

Study Area Noise Environment

The study area is surrounded by the community of Meyers, residential neighborhoods in the vicinity of North Upper Truckee Road, other land within Washoe Meadows SP, and the Sawmill Road area. Generally, low-density residential land uses abut the study area on two sides (west and south).



Source: Data provided by EDAW (now AECOM) in 2006

Locations of Sound Level Measurements and Locations of Receptors

Exhibit 3.12-2

Table 3.12-10
Summary of Ambient Noise Measurements

Measurement	Location[a]	Time	A-Weighted Sound Level (dBA)		
			L_{eq}	L_{max}	Sources
1[b]	Clubhouse Parking Lot	1:13–1:28 p.m.	60.2	67.4	U.S. 50, golfers, parking lot noise
2[b]	Delaware Street, Western Edge	2:01–2:16 p.m.	43.6	64.3	Vehicles, birds, neighborhood noise[c], aircraft
3[b]	Trail Extended from Chilicothe Street	2:26–2:41 p.m.	37.4	49.5	Neighborhood noise[c], birds, vehicles, aircraft
4[b]	Single-Event Test of Lawn Mower	1:41–1:43 p.m.	73.8	80.4	lawn mower
5[b]	Single-Event Test of Lawn Mower	1:44–1:46 p.m.	74.0	82.7	lawn mower
6[d]	Hole 6 Tee box, Country Club Drive	8:45-9:00 a.m.	46.3	61.9	U.S. 50, neighborhood noise[c], vehicles
7[d]	Bakersfield Street Curve	9:15-9:30 a.m.	41.3	59.7	U.S. 50, neighborhood noise[c], vehicles, birds
8[d]	Meyers Elementary Playground	9:35-9:50 a.m.	38.5	53.0	Vehicles, car honk, school HVAC system
9[d]	Central Study Area, west of river	1:10-1:25 p.m.	36.6	54.2	U.S. 50, aircraft, birds
10[d]	Intersection of Seneca Drive and Kiowa Street	1:35-1:50 p.m.	44.7	51.8	Vehicles, aircraft, birds, neighborhood noise[c]

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level; L_{min} = minimum noise level; U.S. 50 = U.S. Highway 50; HVAC = heating ventilation air conditioning

a Ambient noise level measurement locations are shown in Exhibit 3.12-2.

b Measurement conducted on October 12, 2006

c Neighborhood noise refers to typical residential noises such as home and yard maintenance, doors closing, kids playing, music, dogs barking, and people talking.

d Measurement conducted on November 15, 2008

Source: Data monitored by EDAW (now AECOM) on October 12, 2006 and November 15, 2008

Table 3.12-11
Existing Traffic Noise Levels[1]

Roadway Segment	Distance (feet) from Roadway Edge to CNEL/ L_{dn} (dBA)				CNEL/ L_{dn} (dBA) 50 Feet from Roadway Edge
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	
U.S. 50, Sawmill Road to Pioneer Trail	39	84	181	390	66.4
U.S. 50, Pioneer Trail to SR 89	39	84	180	388	65.6

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night noise level; SR = State Route; U.S. 50 = U.S. Highway 50

1 Traffic noise levels were modeled using the Federal Highway Administration's Traffic Noise Prediction Model based on data obtained from the traffic analysis prepared for this project (see Section 3.10, "Transportation and Circulation"). Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings). Refer to Appendix J for traffic noise modeling results.

Source: Modeling performed by EDAW (now AECOM) in 2008

The existing noise environment within the study area on the west side of the Upper Truckee River is influenced by service and maintenance crews, recreationists, and natural sources, such as birds, rustling leaves, and wind. Maintenance crews working on public utilities and forest fuels reduction programs are also present periodically throughout the summer season. Work crews would typically include small pieces of heavy equipment and other power tools, such as chainsaws and chippers. Fuels reduction programs may include thinning, pruning, prescribed burning, and chipping. Utility work would include routine line maintenance and repair. Other sources include transportation noise emanating from vehicular traffic on nearby roadways (U.S. 50), aircraft flyovers, snowmobiles in winter, and maintenance equipment from STPUD and Washoe Meadows SP.

The existing noise environment within the study area on the east side of the Upper Truckee River is influenced by activities at the Lake Tahoe Golf Course. This includes golfers and intermittent noise from other outdoor activities (e.g., people talking, golf carts, dogs barking, golfers at the driving range, golf course tee announcements, snowmobiles, lawn mowers, maintenance equipment, and car doors). Noise levels resulting from the Lake Tahoe Golf Course lawn mowers were measured at 74 dBA L_{eq} at 6 feet (See Table 3.12-10). Lawn mowers would have the highest noise levels of equipment used on the golf course.

Surrounding Area Noise Environment and Noise-Sensitive Receptors

Noise-sensitive land uses generally include those uses where exposure to excessive noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Residential streets located adjacent to the study area (within 500 feet) are on Bakersfield Street, East San Bernardino Avenue, Country Club Drive, and San Diego Street to the east, and West San Bernardino Avenue, Cholula Street, Chilicothe Street, Mushogee Street, Ulmeca Street, Normuk Street, Delaware Street, Kiowa Street, and Seneca Street to the west. The majority of the residences in these two areas consist of single-family homes on ¼-acre to 1-acre lots, including decks, backyards, driveways, and garages. Noise in these areas was characterized by Measurements 2, 6, 7, and 10 in Table 3.12-10 above. Noise levels in these areas were measured at approximately 41–46 dBA L_{eq} with the predominant noise sources being typical neighborhood noise (e.g. dogs barking, doors closing, yard and home maintenance, people talking), and vehicle traffic from U.S.50 and nearby residential streets. Other types of noise-sensitive land uses include schools, hospitals, convalescent facilities, parks, hotels, offices, places of worship, libraries, and other uses where low interior noise levels are essential. Noise-sensitive receptors in the project vicinity consist of dispersed outdoor recreationists in Washoe Meadows SP (surrounding and including the study area), and the Lake Tahoe Environmental Science Magnet School (approximately 1,200 feet east). Noise levels within the Washoe Meadows SP were measured by Measurements 3 and 9 with recorded levels of 37.4 and 36.6 dBA L_{eq}, respectively. Noise levels at Lake Tahoe Environmental Science Magnet School were measured by Measurement 8 with a recorded level of 38.5 L_{eq}. Because there were no school activities occurring at the time of the measurement, it would be expected that during outdoor school activities (e.g., recess or sporting events) noise levels would be much higher. The nearest sensitive receptors (private homes) to the study area west of the Upper Truckee River are on Chilicothe Street, approximately 200 feet from the edge of the proposed golf course relocation area and 100 feet from proposed utility connections (electrical, water, sewer, for the proposed restroom facility). Sensitive receptors east of the Upper Truckee River are on Bakersfield Street, approximately 600 feet from the study area and on Country Club Drive approximately 70-100 feet from existing and proposed golf holes.

3.12.2 Environmental Consequences

Significance Criteria

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal and State agencies and El Dorado County. Federal law defers to State and local regulations for the purposes of assessing noise impacts. TRPA has not set any criteria for vibration, so the State standards are applied in absence of a local standard. In development of mitigation measures for significant impacts of the project, effects on environmental thresholds of the Compact were considered. The project's effects on thresholds are further described in Chapter 4, Section 4.6, "Consequences for Environmental Threshold Carrying Capacities."

CEQA Criteria

A noise impact is considered significant if implementation of the proposed project would result in any of the following:

- short-term construction-generated noise levels that exceed the relevant El Dorado County standards (Tables 3.12-5, 3.12-6, 3.12-7, and 3.12-8) or a substantial increase (greater than 3 dBA) in ambient noise at nearby existing noise-sensitive receptors during the more sensitive early morning, evening, and nighttime hours of the day (i.e., outside the hours considered exempt by the Noise Element of the *El Dorado County General Plan*—7 a.m. and 7 p.m., Monday through Friday, and 8 a.m. and 5 p.m. on weekends, and on Federally recognized holidays);

- long-term (operational) stationary- or area-source noise levels that exceed applicable noise standards (Table 3.12-3) or a substantial increase (greater than 3 dBA) in ambient noise at nearby existing noise-sensitive receptors;

- short- or long-term (operational) traffic-generated noise levels that exceed the relevant El Dorado County noise standards for transportation noise sources (Table 3.12-4) or a substantial increase (greater than 3 dBA) in ambient noise levels at nearby existing noise-sensitive receptors;

- increases in existing CNELs beyond those permitted in the applicable PAS, community plan, or master plan; or

- exposure of persons to or generation of excessive groundborne vibration or noise levels that exceed Caltrans's recommended standard with respect to the prevention of structural building damage (0.2 in/sec PPV and 0.08 in/sec PPV, respectively, for normal and historical buildings) or FTA's maximum-acceptable vibration standard with respect to human response (80 VdB for residential structures) at nearby existing or proposed vibration-sensitive land uses (e.g., residences).

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on noise if it would result in any of the following:

- increases in existing CNELs beyond those permitted in the applicable PAS, community plan, or master plan;

- the exposure of people to severe noise levels; or

- single-event noise levels greater than those set forth in the TRPA Noise Environmental Threshold (Table 3.12-2).

Methods and Assumptions

To assess potential noise impacts from construction, stationary sources, and area sources, noise-sensitive receptors and their relative exposure levels were identified. Noise and vibration levels of specific equipment anticipated to be used in project construction or operation were determined, and resultant noise levels at sensitive receptors were modeled assuming documented noise (vibration) attenuation rates.

The FHWA Traffic Noise Prediction Model was used to model traffic noise levels along affected roadways, based on daily volumes and the distribution thereof from the traffic analysis prepared for this project (which is described in Section 3.10, "Transportation, Parking, and Circulation"). The project's contribution to the existing traffic-source noise levels along area roadways was determined by comparing the modeled noise levels at 50 feet from the roadway edge under existing no-project and existing plus-project conditions. The project's land use compatibility with future (2030) traffic-source noise levels was determined by comparing modeled noise levels at noise-sensitive receptors under plus-project conditions.

The standards of significance applied in this analysis address the exterior noise standards established by El Dorado County. Unless otherwise stated, standards for interior noise levels would not be exceeded if exterior noise-level standards are achieved, because standard construction of buildings would provide sufficient exterior-to-interior noise reduction.

Impacts Found to Be Less Than Significant and Not Discussed Further

Exceedance of Single-Event Noise Level Thresholds – No alternative would result in increasing or creating single-event noise level sources (aircraft, watercraft, motor vehicles, motorcycles, off-road vehicles, and over-snow vehicles) regulated by TRPA (Table 3.12-2). Haul trucks related to construction under all action alternatives would not exceed single-event noise standards (see Table 3.12-12); and they would operate only during exempted hours (see Chapter 2, "Project Alternatives") and therefore would not violate single-event noise standards when applicable. None of the alternatives would create significant single-event noise impacts.

Impact Analysis and Mitigation Measures

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.12-1 (Alt. 1)	Short-Term Project Construction Noise Levels Exceeding Applicable Standards. *Short-term construction activities would not occur under Alternative 1.* No impact *would occur.*

Under Alternative 1, standards for construction noise would not be exceeded because no short-term construction activities would occur. On-site construction equipment would continue to operate as it does today (i.e., fuels management) thus, noise levels would remain comparable to the current conditions. Potential emergency construction may be conducted, as necessary, but this potential for emergencies would be the same as current conditions. The nature and extent of these unforeseeable activities are unknown and would not be a direct result of implementing Alternative 1. No impact would occur.

No mitigation is required.

IMPACT 3.12-2 (Alt. 1)	Long-Term Project-Related Generation of Stationary- and Area-Source Noise. *Alternative 1 would not include any new long-term stationary and area noise sources and, thus, would not generate additional noise from such sources.* No impact *would occur.*

Alternative 1 would not include any new long-term stationary and area-noise sources. Use of the study area (e.g., golf course and passive recreation areas) would remain comparable to existing use. Heavy equipment and power tools (e.g., chainsaws, wood chippers) would continue to be used for public utility maintenance and fuels reduction programs. Lawn mowing, golfing activities, recreation, and other miscellaneous activities would continue as they do today and would generate noise levels consistent with those presented above. Thus, ambient noise and noise from pedestrian activity would not change and would remain comparable to existing levels. No impact would occur.

No mitigation is required.

IMPACT 3.12-3 (Alt. 1) **Long-Term Generation of Project-Related Traffic Noise.** *There would be no long-term change in traffic caused by activities in the study area; therefore, Alternative 1 would not increase ambient noise levels on nearby local roadways or highways.* ***No impact*** *would occur.*

Implementing Alternative 1 would not result in a long-term change in traffic caused by activities in the study area. No increase in patronage, employees, parking, or trip generation would be created under Alternative 1. Traffic noise would, therefore, be consistent with the modeling conducted for existing traffic on U.S. 50. As a result, implementing this alternative would not change ambient noise levels on nearby local roadways or highways. No impact would occur.

No mitigation is required.

IMPACT 3.12-4 (Alt. 1) **Land Use Compatibility of Study Area Noise Levels and Surrounding Land Uses.** *Noise from surrounding land uses would not cause applicable standards to be exceeded within the study area, and no new noise sources would be created that would increase noise levels at surrounding land uses.* ***No impact*** *would occur.*

Implementing Alternative 1 would not result in a long-term change in ambient noise levels in and around the study area. No increase in patronage, recreation activities, employees, parking, or trip generation would be created under Alternative 1. In addition, no new sources would be introduced to the study area under this alternative, so noise levels at surrounding land uses would not increase. Traffic noise would be consistent with the modeling conducted for existing traffic on U.S. 50. Implementing this alternative would not change ambient noise levels from area, stationary, or mobile sources and therefore no change or project-related land-use compatibility conflicts would occur. There would be no impact.

No mitigation is required.

IMPACT 3.12-5 (Alt. 1) **Short- and Long-Term Increases in Groundborne Vibration Levels.** *Alternative 1 would not generate groundborne vibration, so human activities, including sleep, would not be disrupted, and structures would not be damaged.* ***No impact*** *would occur.*

Under Alternative 1, no construction or any other sources of vibration would occur. In addition, no existing vibration sources exist. As a result, this alternative would not generate groundborne vibration, so human activity would not be disrupted and structures would not be damaged. No impact would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.12-1 (Alt. 2) **Short-Term Project Construction Noise Levels Exceeding Applicable Standards.** *Noise-generating construction activities related to implementation of Alternative 2 would be limited to the hours during which construction noise is exempt from the provisions of the applicable standards, would not exceed the applicable standards during nonexempt hours, and would not increase traffic noise by a substantial amount (+3 dB or more). Therefore, this impact would be* ***less than significant****.*

The construction activities required for Alternative 2 include tree removal, excavating, grading, removing and replacing vegetation (including sod), clearing, bridge removal and installation, pile driving, utility connections, finishing, cleaning up the construction site, building construction, transporting materials, winterizing the site, and paving cart paths and additional parking areas.

The specific construction equipment required for the above-mentioned activities is included in Table 2-4 of Chapter 2, "Project Alternatives." According to FTA and FHWA, and as shown in Table 3.12-12, maximum noise levels for these types of equipment can range from 77 to 101 dBA L_{max} at 50 feet when used without feasible noise control. For all but 1 week of the construction schedule the equipment-generated maximum combined noise levels would be approximately 85 dBA L_{eq} at 50 feet (FTA 2006:12-6, 12-7). Based on a noise level of 85 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1,700 feet could experience noise levels that would exceed the minimum local PAS standard: 50 dBA CNEL.

Table 3.12-12
Typical Equipment Noise Levels

Type of Equipment	Noise Level (dBA) at 50 feet	
	Manufacturer's Specifications (L_{max})	Actual (L_{max})
Backhoe	80	77.6
Grader	85	NA
Dozer	85	81.7
Backhoe	80	77.6
Pickup truck	55	75
Dump truck	84	76.5
Excavator	85	80.7
Pumps	77	80.9
Trenching machine	82	80.4
Impact pile driver	95	101.3
Paver	85	77.2

Notes: dBA = A-weighted decibels; L_{max} = maximum noise level; NA = not available.
Sources: FTA 2006:Table 12-1, FHWA 2006

Pile driving would occur for approximately 1 week in the first year of construction to install bridge footings (Table 2-4). Additional pile driving would occur for short periods of time during sewer line rerouting and stabilization. Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 7). Based on a noise level of 95 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1 mile could exceed the minimum local PAS standard: 50 dBA CNEL and within 800 feet could exceed El Dorado County L_{max} standards. See Appendix J for construction-generated noise modeling calculations.

In addition, project construction under Alternative 2 would result in a short-term increase in traffic on the local roadway network. It is expected that up to 21 daily haul truck round trips would occur during the periods of maximum construction activity. Construction-related traffic would be distributed over the roadway network identified in Section 3.10, "Transportation, Parking, and Circulation" (e.g., access points include Sawmill Road, Lake Tahoe Golf Course driveway, Country Club Drive, and Chilicothe Street). A maximum of 21 daily haul-truck round trips would traverse the haul routes designated in Section 3.10. Typically, traffic must double to create an increase in perceptible traffic noise (+3 dB or more) (Caltrans 1998:N-96). Because all affected roadways, except Chilicothe Street, have a peak-month minimum of at least 100 ADT, an increase of 21 trips would not double the current traffic level and consequently would not result in a substantial increase in average daily traffic noise. Seven daily haul trips are expected on Chilicothe Street; these trips would not represent a substantial increase in traffic or associated traffic noise levels. Single event noise from truck pass-bys would not exceed the TRPA standard of 82 dBA at 50 feet or the El Dorado County standard of 75 dBA at 60 feet (see Tables 3.12-2, 3.12-7, and 3.12-12). Therefore, construction-related traffic on affected segments would not increase traffic noise levels.

Noise from construction activity that occurs between 8 a.m. and 6:30 p.m. each day is exempt from the provisions of the applicable TRPA regulations. Noise from construction activity that occurs between 7 a.m. and 7 p.m. on weekdays (or between 8 a.m. and 5 p.m. on weekends and Federal holidays) is exempt from the provisions of the applicable El Dorado County regulations. In addition, construction activities would be temporary, and as described in Chapter 2, "Project Alternatives," noise-generating construction activities would not occur during the more noise-sensitive hours (i.e., before 8 a.m. and after 6:30 p.m. on weekdays or after 5 p.m. on weekends or Federal holidays). Additionally, project-generated construction traffic would not create a substantial increase in average local traffic noise levels. Because noise from project construction sources would be exempt, would not exceed the applicable standards during nonexempt hours, and would not increase traffic noise by a substantial amount (+3 dB or more), this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-2 (Alt. 2)	Long-Term Project-Related Generation of Stationary- and Area-Source Noise. *Alternative 2 would not include any new long-term project-generated stationary- or area-source noise. Existing noise sources related to golf course users and golf course maintenance would be relocated to the west side of the Upper Truckee River. While golf course related-activity would be closer to residential uses in the vicinity of North Upper Truckee Road, noise from relocated golf course sources would not exceed applicable standards for any residential areas in the project vicinity. This impact would be* **less than significant**.

Under Alternative 2, the restoration features along the Upper Truckee River would not create new stationary- or area-source noise. Heavy equipment and power tools (e.g. chainsaws, wood chippers) would continue to be used as they are today for public utility maintenance and fuels reduction programs.

In addition to river restoration features, Alternative 2 includes the relocation of 7 complete and 2 partial golf holes to the west side of the Upper Truckee River. Noise sources associated with the relocated holes would be from lawn mowers, golf carts, people talking, and other noises associated with playing golf (e.g. golf ball strikes). Noise emanating from lawn mowers would be the loudest source; during noise monitoring on the existing golf course, lawn mower noise was measured at 74.0 dBA L_{eq} at 6 feet (Table 3.12-10). The maximum duration that lawn mowers would operate at the proposed hole (hole 10) nearest to sensitive receptors (Chilicothe Street residences) would be approximately 2 hours per day (Stanowski, pers. comm., 2009). Based on a noise level of 74 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, noise levels from the lawn mowers would be less than 50 dBA L_{eq} (the most stringent applicable standard for residential areas) at 90 feet, no lawn mowing operations would occur within 90 feet of sensitive receptors, and all other noise sources associated with the relocated golf holes would be quieter than lawn mowers; no violation of noise standards for residential areas would occur under Alternative 2.

In regards to PAS standards, the noise survey conducted for this project measured existing noise levels in the meadow at 36.6 dBA L_{eq} near Seneca Drive (Table 3.12-10). This equates to 43.3 dBA CNEL. The addition of noise from lawn mowers for 2 hours per day increases this noise level to 44.4 dBA CNEL, a 1.1-dBA-CNEL increase from existing conditions. Noise from people talking, golf carts, and other golfing-related activities would be lower in magnitude than noise from lawn mowers but would occur throughout daytime hours during the seasonal periods of operation of the golf course (approximately April 15 to November 1 from dawn until dusk). As stated in the acoustical fundamentals section, typical conversation of a human being is approximately 60 dBA L_{eq} at 3 feet. Assuming four people in a golf group and, during peak season, a continuous stream of golfers playing on a weekend day, noise levels, including lawn mowing and nongolfing hours, worst-case noise levels would be approximately 44.6 dBA CNEL, an increase of approximately 1.3 dBA CNEL above baseline conditions. See Appendix J for detailed area-source noise modeling calculations. This level, which would include the golf course-related noise in the golf hole relocation area of Washoe Meadows SP, would be well below the most stringent noise standards for land uses in the vicinity, i.e., 50 dBA CNEL. The addition of the golf course-related noise west of the river would not result in significant noise impacts.

Noise measurements taken on the east side of the river measured noise levels between 38.5 and 46.3 dBA L_{eq} (see Table 3.12-10). Golfing activities and associated noise currently occur on the east side of the golf course and would remain the same for residences along Bakersfield Street and Country Club Drive and would be reduced for residences along Sawmill Road. Therefore, noise levels would remain the same as or less than under baseline conditions. The addition of the golf course-related noise east of the river would not result in significant noise impacts.

Because noise would not increase by a substantial amount (i.e., +3 dBA) at any nearby sensitive receptors or exceed any applicable standards (i.e., 50 dBA L_{eq} El Dorado County Open Space standard and 50 dBA CNEL PAS standard), implementation of Alternative 2 would not violate applicable significance criteria for the surrounding noise-sensitive receptors and study area. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-3 (Alt. 2)	**Long-Term Generation of Project-Related Traffic Noise.** *Long-term project-generated traffic would not result in a perceptible increase in ambient noise levels on nearby local roadways or highways, because traffic generating uses and access to the golf course would not change substantially. This impact would be* ***less than significant****.*

Operation of Alternative 2 would not result in an increase in local traffic. After project completion, the study area would return to use as a golf course and passive recreation area, similar to its existing condition. No increase in patrons is expected, employee levels would increase by four employees, and although paved parking would increase by 89 spaces, this area is already being used to park vehicles, so no parking capacity beyond existing conditions would be created. Therefore, no substantial increase in vehicle traffic would occur, and traffic noise levels would be approximately the same as under existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-4 (Alt. 2)	**Land Use Compatibility of Study Area Noise Levels and Surrounding Land Uses.** *Noise from surrounding land uses would not cause applicable standards to be exceeded within the study area, and no new noise sources would be created by the project that would increase noise levels at surrounding land uses. This impact would be* ***less than significant****.*

After project completion, the study area would include a golf course and passive recreation area, similar to its existing condition, although the location of golfing activity would change. No major sound sources would be created by the project under Alternative 2. The relocated golf holes would increase noise levels on the west side of the Upper Truckee River. However, as stated above in the discussion of Impact 3.12-2 (Alt. 2), noise from the relocated golf activities and maintenance would not violate noise standards at the nearest sensitive receptors (including residences and recreationists). Based on noise measurements taken in the project vicinity, noise levels are in compliance with the applicable standards: 50 dBA CNEL for residential neighborhoods surrounding the study area and 55 dBA CNEL within the study area as well as the 50 dBA L_{eq} El Dorado County standard for Open Spaces (Tables 3.12-7 and 3.12-10). Additionally, no increase in traffic is expected to occur. Therefore, traffic noise levels would remain similar to current levels.

After completion of construction, noise levels would return to their preproject levels. Because no applicable standards would be exceeded within the study area or at nearby sensitive receptors as a result of implementing Alternative 2, no increases in existing CNELs beyond those permitted in the applicable PAS would occur. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-5 (Alt. 2)	**Short- and Long-Term Increases in Groundborne Vibration Levels.** *Project-generated groundborne vibration would not cause disruption to humans or damage to structures. This impact would be* ***less than significant****.*

Long-term project operation under Alternative 2 would not include any major sources of vibration. However, construction activities could result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and activities involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 3.12-13 displays vibration levels for typical construction equipment.

As discussed above, on-site construction equipment would include graders, dozers, excavators, haul trucks, water trucks, and pile drivers (pile driving would occur at the center of the site and for 1 week). According to FTA, vibration levels associated with the use of bulldozers range from approximately 0.003 to 0.089 in/sec PPV and from 58 to 87 vibration decibels (VdB referenced to 1 μin/sec and based on the RMS velocity amplitude) at 25 feet, as shown in Table 3.12-13. Using FTA's recommended procedure for applying a propagation adjustment to these reference levels, vibration levels would exceed recommended thresholds (0.2 PPV, 80 VdB) within 45 feet of bulldozers and 40 feet of trucks. The residences nearest to these activities are approximately 70 feet away on Country Club Drive and 100 feet away on Chilicothe Street. Because sensitive receptors are not within 45 feet, vibration levels would not exceed Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2002:11) with respect to the prevention of structural damage for normal buildings or FTA's maximum-acceptable vibration standard of 80 VdB (FTA 2006) with respect to human annoyance for residential uses.

Table 3.12-13 Typical Construction-Equipment Vibration Levels			
Equipment		PPV at 25 feet (in/sec)[1]	Approximate L_v at 25 feet[2]
Pile driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large bulldozer		0.089	87
Trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

1 Where PPV is the peak particle velocity

2 Where L_v is the velocity level in decibels (VdB) referenced to 1 microinch/second and based on the root mean square velocity amplitude.

Source: FTA 2006

During pile-driving activities, vibration levels associated with the use of pile drivers range from approximately 0.644 to 1.518 in/sec PPV and from 104 to 112 VdB at 25 feet, as shown in Table 3.12-13. Using FTA's recommended procedure for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels of approximately 0.01 in/sec PPV and 70 VdB would occur at 600 feet (the residence nearest to the location of pile-driving activities for new bridge footings). These vibration levels would not be well below Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2002) with respect to the prevention of structural damage for normal buildings or FTA's maximum-acceptable vibration standard of 80 VdB (FTA 2006) with respect to human annoyance for residential uses.

As stated in the discussion of Impact 3.12-1 (Alt. 2), project construction and thus vibration levels associated with Alternative 2 would be limited to the daytime hours of 8 a.m. to 6:30 p.m. on weekdays and 8 a.m. to 5 p.m. on weekends/holidays, as required by TRPA and El Dorado County regulations. Additionally, as stated above, vibration levels would exceed recommended thresholds only within 45 feet of construction activities, and the nearest receptors are a minimum of 70 feet from proposed actions. Therefore, because no recommended standards would be exceeded at nearby sensitive receptors as a result of implementing Alternative 2, the project is not anticipated to result in the exposure of sensitive receptors to excessive vibration levels. This impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.12-1 (Alt. 3)	Short-Term Project Construction Noise Levels Exceeding Applicable Standards. *Noise-generating construction activities related to implementation of Alternative 3 would be limited to the hours during which construction noise is exempt from the provisions of the applicable standards, would not exceed the applicable standards during nonexempt hours, and would not increase traffic noise by a substantial amount (+3 dB or more). Therefore, this impact would be* ***less than significant****.*

Construction activities under Alternative 3 would be similar to those under Alternative 2, but would not include any activities on the west side of the Upper Truckee River, new structures, or parking lots.

The specific construction equipment required for the above-mentioned activities is identified in Table 2-6 of Chapter 2, "Project Alternatives." According to FTA and FHWA, maximum noise levels for these types of equipment can range from 78 to 85 dBA at 50 feet when used without feasible noise control (Table 3.12-12). The noise levels from equipment operations would result in a maximum combined noise level of 85 dBA L_{eq} at 50 feet (FHWA 2006:12-6, 7). Based on a noise level of 85 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1,700 feet could exceed the minimum local PAS standard: 50 dBA CNEL.

Pile driving would occur for short periods of time during sewer line rerouting and stabilization. Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 7). Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 7). Based on a noise level of 95 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1 mile could exceed the minimum local PAS standard: 50 dBA CNEL and within 800 feet could exceed El Dorado County L_{max} standards. See Appendix J for construction-generated noise modeling calculations.

In addition, project construction under Alternative 3 would result in a short-term increase in traffic on the local roadway network. It is expected that up to 37 daily haul round trips would occur during the periods of maximum construction activity. As under Alternative 2, construction-related traffic would be distributed over the roadway network identified in Section 3.10, "Transportation, Parking, and Circulation." The daily haul-truck trips would traverse haul routes designated in Section 3.10 (e.g., access points include Sawmill Road, Lake Tahoe Golf Course driveway, Country Club Drive, and Chilicothe Street). Typically, traffic must double to create an increase in perceptible traffic noise (Caltrans 1998:N-96). Because all affected roadways, except Chilicothe Street, have a peak-month minimum of at least 100 ADT, an increase of 37 round trips would not double the current traffic level and subsequently not result in a substantial increase in traffic noise. Less than one daily haul trip is expected on Chilicothe Street. This trip would not represent a substantial increase in traffic or traffic noise levels. Therefore, construction-related traffic on affected roadway segments would not substantially increase traffic noise levels.

Noise from construction activity that occurs between 8 a.m. and 6:30 p.m. each day is exempt from the provisions of the applicable TRPA regulations. Noise from construction activity that occurs between 7 a.m. and 7 p.m. on weekdays (or between 8 a.m. and 5 p.m. on weekends and Federal holidays) is exempt from the provisions of the applicable El Dorado County regulations. In addition, construction activities would be temporary, and, as described in Chapter 2, "Project Alternatives," noise-generating construction activities would not occur during the more noise-sensitive hours (i.e., before 8 a.m. and after 6:30 p.m. on weekdays or after 5 p.m. on weekends or Federal holidays). As discussed above, project-generated construction traffic would not create a substantial increase in local traffic-noise levels. Because noise from project construction sources would be exempt, would not exceed the applicable standards during nonexempt hours, and would not increase noise by a substantial amount (+3 dB or more), this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-2 (Alt. 3) **Long-Term Project-Related Generation of Stationary- and Area-Source Noise.** *Alternative 3 would not include any new long-term stationary or area noise sources. Noise sources related to golfing and maintenance would be similar to or less than under existing conditions as a result of the reduced play golf course. Noise from the reduced play golf course would not exceed applicable standards in the project vicinity. This impact would be* ***less than significant.***

Under Alternative 3, the restoration features along the Upper Truckee River would not create new stationary- or area-source noise. Heavy equipment and power tools (e.g., chainsaws, wood chippers) would continue to be used as they are today for public utility maintenance and fuels reduction programs.

In addition to river restoration features, Alternative 3 includes the reduction of the existing golf course to a reduced play golf course. The footprint of the reduced play golf course would be less than the existing course and would include existing golf holes. No new golf holes nor any noise sources would be created or relocated to the west side of the river or other parts of the study area. Noise sources would either remain in their existing locations or be removed as a result of a reduced course. Because golfing activities and maintenance would not occur in any new locations and would be reduced from existing conditions, noise resulting from long-term operation of the project would be similar to or less than under existing conditions.

Because noise would not increase by a substantial amount (i.e., +3 dBA) at any nearby sensitive receptors or exceed any applicable standards (i.e., 50 dBA L_{eq} and 50 dBA CNEL), implementation of Alternative 3 would not violate applicable significance criteria for the surrounding noise-sensitive receptors and study area. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-3 (Alt. 3)	Long-Term Generation of Project-Related Traffic Noise. *Long-term project-generated traffic would not result in a perceptible increase in ambient noise levels on the affected roadway network. This impact would be **less than significant**.*

Impact 3.12-3 (Alt. 3) would be similar to Impact 3.12-3 (Alt. 2). Alternative 3 is different from Alternative 2 in that employee levels would be reduced by approximately 11–16 employees and the paving of an additional 89 parking spaces would not be included under Alternative 3. As a result, traffic levels would be similar to or less than under existing conditions. Subsequently, traffic noise related to the golf course would also be similar to or less than under existing conditions. Therefore, no substantial increase in vehicle traffic would occur, and traffic noise levels would be approximately the same as under existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-4 (Alt. 3)	Land Use Compatibility of Study Area Noise Levels and Surrounding Land Uses. *Noise from surrounding land uses would not cause applicable standards to be exceeded within the study area, and no new noise sources would be created that would increase noise levels at surrounding land uses. Therefore, no substantial changes to land use compatibility related to noise would occur. This impact would be **less than significant**.*

Impact 3.12-4 (Alt. 3) would be similar to Impact 3.12-4 (Alt. 2). Alternative 3 is different from Alternative 2 in that noise sources would not be relocated to the west side of the Upper Truckee River and area-source noise would be similar to or decreased as a result of the reduced play golf course under Alternative 3. Subsequently, no applicable noise standards would be exceeded, and no new noise sources would be created or relocated. Because no applicable standards would be exceeded within the study area or at nearby sensitive receptors as a result of implementing Alternative 3, no increases in existing CNELs beyond those permitted in the applicable PAS would occur. Refer to the discussion of Impact 3.12-4 (Alt. 2) for a more detailed discussion of land use compatibility of the study area and surrounding areas. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-5 (Alt. 3) **Short- and Long-Term Increases in Groundborne Vibration Levels.** *Project-generated groundborne vibration would not disrupt humans' activities, including sleep, or damage structures. This impact would be* ***less than significant****.*

Impact 3.12-5 (Alt. 3) would be similar to Impact 3.12-5 (Alt. 2). No long-term vibration sources would be created, and construction activities would be restricted to 8 a.m. to 6:30 p.m. on weekdays (and to 5 p.m. on weekends and Federal holidays). Because no recommended standards would be exceeded at nearby sensitive receptors as a result of implementing Alternative 3, the project is not anticipated to result in the exposure of sensitive receptors to excessive vibration levels. Refer to the discussion of Impact 3.12-5 (Alt. 2) for a more detailed discussion of project-generated groundborne vibration. This impact would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.12-1 (Alt. 4) **Short-Term Project Construction Noise Levels Exceeding Applicable Standards.** *Noise-generating construction activities related to implementation of Alternative 4 would be limited to the hours during which construction noise is exempt from the provisions of the applicable standards, would not exceed the applicable standards during nonexempt hours, and would not increase traffic noise by a substantial amount (+3 dB or more). Therefore, this impact would be* ***less than significant****.*

Golf course related construction activities under Alternative 4 would be lesser in magnitude than those under Alternative 2 and would not include any activities on the west side of the Upper Truckee River, other than along the river corridor. However, Alternative 4 would include additional in channel stabilization work while under Alternative 2 the river would be rerouted to a more meandering route. In addition, two bridges would be replaced and three would remain, and grading and vegetation removal would be less than Alternative 2. Materials delivered for Alternative 4 would differ in that more rock would be brought in. Less sod and asphalt would be required than in Alternative 2.

The specific construction equipment required for the above-mentioned activities is identified in Table 2-8 of Chapter 2, "Project Alternatives." According to FTA and FHWA, maximum noise levels for these types of equipment can range from 78 to 85 dBA at 50 feet when used without feasible noise control (Table 3.12-12). The noise levels from equipment operations would equate to a maximum combined noise level of 85 dBA L_{eq} at 50 feet (FHWA 2006:12-6, 12-7). Based on a noise level of 85 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1,700 feet could exceed the minimum local PAS standard: 50 dBA CNEL.

Pile driving would occur for approximately 1 week in the first year of construction to install bridge footings (Table 2-8). Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 12-7). Based on a noise level of 95 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1 mile could exceed the minimum local PAS standard: 50 dBA CNEL. See Appendix J for construction-generated noise modeling calculations.

In addition, project construction under Alternative 4 would result in a short-term increase in traffic on the local roadway network. It is expected that up to 49 daily round haul trips would occur during the periods of maximum construction activity. As under Alternative 2, construction-related traffic would be distributed over the roadway network identified in Section 3.10, "Transportation, Parking, and Circulation." The daily haul-truck trips would traverse haul routes designated in Section 3.10 (e.g., access points include Sawmill Road, Lake Tahoe Golf Course driveway, Country Club Drive, and Chilicothe Street). Typically, traffic must double to create an increase in perceptible traffic noise (Caltrans 1998:N-96). Because all affected roadways except Chilicothe Street have a peak-month minimum of at least 100 ADT, an increase of 49 round trips would not double the current traffic level and subsequently would not result in a substantial increase in traffic noise levels. Six daily haul trips are expected on Chilicothe Street. These trips would not represent a substantial increase in traffic or traffic noise levels. Therefore, construction-related traffic on affected roadway segments would not increase traffic noise levels.

Noise from construction activity that occurs between 8 a.m. and 6:30 p.m. each day is exempt from the provisions of the applicable TRPA regulations. Noise from construction activity that occurs between 7 a.m. and 7 p.m. on weekdays (or between 8 a.m. and 5 p.m. on weekends and Federal holidays) is exempt from the provisions of the applicable El Dorado County regulations. In addition, construction activities would be temporary, and, as described in Chapter 2, "Project Alternatives," noise-generating construction activities would not occur during the more noise-sensitive hours (i.e., before 8 a.m. and after 6:30 p.m. on weekdays or after 5 p.m. on weekends or Federal holidays). Additionally, project-generated construction traffic would not create an increase in local traffic noise levels. Because noise from project construction sources would be exempt, would not exceed the applicable standards during nonexempt hours, and would not increase noise by a substantial amount (+3 dB or more), this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-2 (Alt. 4)	Long-Term Project-Related Generation of Stationary- and Area-Source Noise. *Alternative 4 would not include any new long-term stationary or area noise sources. Noise sources related to golfing and maintenance would be similar to existing conditions as a result of keeping the existing golf course. Noise from the golf course sources would not exceed applicable standards in the project vicinity. This impact would be* ***less than significant.***

Under Alternative 4, the restoration features along the Upper Truckee River would not create new stationary- or area- source noise. Heavy equipment and power tools (e.g., chainsaws, wood chippers) would continue to be used as they are today for public utility maintenance and fuels reduction programs.

In addition to restoration activities, Alternative 4 involves replacing cart bridges, redesigning holes 6 and 7, and building a restroom facility adjacent to hole 5. No new golf holes would be created, nor would any noise sources be created or relocated to the west side of the river or other portions of the study area. Noise sources would remain in their existing locations. Because golfing activities and maintenance would not occur in any new locations and would be similar to existing conditions, noise resulting from long-term operation of the project would be similar to existing conditions.

Because noise would not increase by a substantial amount (i.e., +3 dBA) at any nearby sensitive receptors or exceed any applicable standards (i.e., 50 dBA L_{eq} and 50 dBA CNEL), implementation of Alternative 4 would not violate applicable significance criteria for the surrounding noise-sensitive receptors and study area. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-3 (Alt. 4)	Long-Term Generation of Project-Related Traffic Noise. *Long-term project-generated traffic would not result in a perceptible increase in ambient noise levels on the affected roadway network. This impact would be* ***less than significant.***

Impact 3.12-3 (Alt. 4) would be similar to Impact 3.12-3 (Alt. 2). Alternative 4 is different from Alternative 2 in that the number of employees would remain the same as under existing conditions. As result, traffic volumes and the associated traffic noise would not increase. However, as under Alternative 2, Alternative 4 would include the paving of an additional 89 parking spaces. The additional parking area, as discussed above, is not expected to increase demand but is meant to reduce the need for parking on nonpaved surfaces. As a result, traffic levels would remain similar to existing conditions. Therefore, no substantial increase in vehicle traffic would occur, and

traffic noise levels would be approximately the same as under existing conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-4 (Alt. 4)	Land Use Compatibility of Study Area Noise Levels and Surrounding Land Uses. *Noise from surrounding land uses would not cause applicable standards to be exceeded within the study area, and no new noise sources would be created that would increase noise levels at surrounding land uses. Therefore, no substantial changes to land use compatibility related to noise would occur. This impact would be* ***less than significant****.*

Impact 3.12-4 (Alt. 4) would be similar to Impact 3.12-4 (Alt. 2). Alternative 4 is different from Alternative 2 in that noise sources would not be relocated to the west side of the Upper Truckee River under Alternative 4, so noise levels would be similar to existing conditions. Subsequently, no noise standards would be exceeded, and no new sources would be created or relocated. Because no applicable standards would be exceeded within the study area or at nearby sensitive receptors as a result of implementing Alternative 4, no increases in existing CNELs beyond those permitted in the applicable PAS would occur. Refer to the discussion of Impact 3.12-4 (Alt. 2) for a more detailed discussion of land use compatibility of the study area and surrounding areas. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-5 (Alt. 4)	Short- and Long-Term Increases in Groundborne Vibration Levels. *Project-generated groundborne vibration would not disrupt humans' activities, including sleep, or damage structures. This impact would be* ***less than significant****.*

Impact 3.12-5 (Alt. 4) would be similar to Impact 3.12-5 (Alt. 2). Vibration generating activities from Alternative 4 would include a reduction in pile driving activities as, such as those under Alternative 2. No long-term vibration sources would be created, and construction activities would be restricted to 8 a.m. to 6:30 p.m. on weekdays (and to 5 p.m. on weekends and Federal holidays). Because no recommended standards would be exceeded at nearby sensitive receptors as a result of implementing Alternative 4, the project is not anticipated to result in the exposure of sensitive receptors to excessive vibration levels. Refer to the discussion of Impact 3.12-5 (Alt. 2) for a more detailed discussion of project-generated groundborne vibration. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.12-1 (Alt. 5)	Short-Term Project Construction Noise Levels Exceeding Applicable Standards. *Noise-generating construction activities related to implementation of Alternative 5 would be limited to the hours during which construction noise is exempt from the provisions of the applicable standards, would not exceed the applicable standards during nonexempt hours, and would not increase traffic noise by a substantial amount (+3 dB or more). Therefore, this impact would be* ***less than significant****.*

Construction activities under Alternative 5 would be lesser in magnitude than those under Alternative 2 and would not include any activities on the west side of the Upper Truckee River (except along river corridor), new structures, or paving of parking lots. Construction activities would be concentrated in the existing golf course area and along the river. Unlike Alternative 2, less material hauling would occur. The specific construction equipment required for the above-mentioned activities is included in Table 2-10 of Chapter 2, "Project Alternatives." According to FTA and FHWA, maximum noise levels for these types of equipment can range from 78 to 85 dBA at 50 feet when used without feasible noise control (Table 3.12-12). The noise levels from equipment operations would equate to a maximum combined noise level of 85 dBA L_{eq} at 50 feet (FHWA 2006:12-6, 12-7). Based on a noise level of 85 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1,700 feet could exceed the minimum local PAS standard: 50 dBA CNEL.

Pile driving would occur for short periods of time during sewer line rerouting and stabilization. Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 7). Noise levels associated with pile driving and other ongoing activities would result in a maximum combined noise level of approximately 95 dBA L_{eq} at 50 feet (FTA 2006:12-6, 7). Based on a noise level of 95 dBA L_{eq}, a typical noise-attenuation rate of 6 dBA/DD, and no intervening shielding or topographic interference, exterior noise levels at noise-sensitive receptors located within 1 mile could exceed the minimum local PAS standard: 50 dBA CNEL and within 800 feet could exceed El Dorado County L_{max} standards. See Appendix J for construction-generated noise modeling calculations.

In addition, project construction under Alternative 5 would result in a short-term increase in traffic on the local roadway network. It is expected that up to 22 daily haul trips would occur during the periods of maximum construction activity. As under Alternative 2, construction-related traffic would be distributed over the roadway network identified in Section 3.10, “Transportation, Parking, and Circulation.” The daily haul-truck trips would traverse haul routes designated in Section 3.10 (e.g., access points include Sawmill Road, Lake Tahoe Golf Course driveway, Country Club Drive, and Chilicothe Street). Typically, traffic must double to create an increase in perceptible traffic noise (Caltrans 1998:N-96). Because all affected roadways except Chilicothe Street have a peak-month minimum of at least 100 ADT, an increase of 22 trips would not double the current traffic levels and subsequently would not result in a substantial increase in traffic noise levels. Less than one daily haul trip is expected on Chilicothe Street. This trip would not represent a substantial increase in traffic or traffic noise levels. Therefore, construction-related traffic on affected segments would not increase traffic noise levels.

Noise from construction activity that occurs between 8 a.m. and 6:30 p.m. each day is exempt from the provisions of the applicable TRPA regulations. Noise from construction activity that occurs between 7 a.m. and 7 p.m. on weekdays (or between 8 a.m. and 5 p.m. on weekends and Federal holidays) is exempt from the provisions of the applicable El Dorado County regulations. In addition, construction activities would be temporary, and, as described in Chapter 2, “Project Alternatives,” noise-generating construction activities would not occur during the more noise-sensitive hours (i.e., before 8 a.m. and after 6:30 p.m. on weekdays or after 5 p.m. on weekends or Federal holidays). Additionally, project-generated construction traffic would not create an increase in local traffic noise levels. Because noise from project construction sources would be exempt, would not exceed the applicable standards during nonexempt hours, and would not increase noise by a substantial amount (+3 dB or more), this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-2 (Alt. 5)	**Long-Term Project-Related Generation of Stationary- and Area-Source Noise.** *Alternative 5 would not include any new long-term stationary or area noise sources. Existing noise sources related to golfing and maintenance would be reduced or eliminated as a result of the partial removal of the golf course. Noise from the remaining golf holes or other sources would not exceed applicable standards in the project vicinity. This impact would be* ***less than significant****.*

Under Alternative 5, the restoration features along the Upper Truckee River would not create new stationary- or area-source noise. Heavy equipment and power tools (e.g., chainsaws, wood chippers) would continue to be used as they are today for public utility maintenance and fuels reduction programs.

In addition to restoration features, Alternative 5 in the long-term includes the removal of existing bridges and the golf course. The golf course would be removed and restored as a floodplain and meadow. In the interim the golf course may operate as a nine-hole facility until restoration is complete. Future uses of the SRA and the entirety of

Washoe Meadows SP would be evaluated as a separate planning process. No new noise sources would be created or relocated to different portions of the study area as part of the proposed alternative. Existing noise from golfers, golf carts, lawn mowing, and other miscellaneous sources related to golf course operations would no longer exist. The clubhouse, maintenance yard, and parking areas would remain in their existing locations and their use would be evaluated during a separate planning process. The maintenance yard would provide a place to store maintenance equipment and supplies for the restored river and meadow. Because golfing activities and maintenance would not occur in any new locations and would be removed from existing locations, noise resulting from long-term operation of the project would be less than under existing conditions.

Because noise would not increase by a substantial amount (i.e., +3 dBA) at any nearby sensitive receptors or exceed any applicable standards (i.e., 50 dBA L_{eq} and 50 dBA CNEL), implementation of Alternative 5 would not violate applicable significance criteria for the surrounding noise-sensitive receptors and study area. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.12-3 (Alt. 5)	**Long-Term Generation of Project-Related Traffic Noise.** *Long-term project-generated traffic would not result in a perceptible increase in ambient noise levels on the affected roadway network. This impact would be* ***less than significant****.*

Impact 3.12-3 (Alt. 5) would be less than the analogous long-term traffic noise effects of other alternatives. Alternative 5 is different from Alternatives 2, 3, and 4 in that employee and patron vehicle trips related to golf course operations would be eliminated and the paving of an additional 89 parking spaces would not occur. As a result, traffic levels would be less than under existing conditions or any of the other alternatives. Subsequently, traffic noise related to the golf course would also be less than under existing conditions or those of the other alternatives. Therefore, no substantial increase in vehicle traffic would occur, and traffic noise levels would be less than under existing conditions or other alternatives. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-4 (Alt. 5)	**Land Use Compatibility of Study Area Noise Levels and Surrounding Land Uses.** *Noise from surrounding land uses would not cause applicable standards to be exceeded within the study area, and no new noise sources would be created that would increase noise levels at surrounding land uses. Therefore, no substantial changes to land use compatibility related to noise would occur. This impact would be* ***less than significant****.*

Alternative 5 is different from Alternatives 2, 3 and 4 in that the golf course and its associated noise sources would be removed from the Lake Valley SRA. Noise levels in the project vicinity under Alternative 5 would be less than under all other alternatives. Subsequently, no standards would be exceeded, and no new sources would be created or relocated. Because no applicable standards would be exceeded within the study area or at nearby sensitive receptors as a result of implementing Alternative 5, no increases in existing CNELs beyond those permitted in the applicable PAS would occur. Refer to the discussion of Impact 3.12-4 (Alt. 2) for a more detailed discussion of land use compatibility of the study area and surrounding areas. This impact would be less than significant.

No mitigation is required.

IMPACT 3.12-5 (Alt. 5) **Short- and Long-Term Increases in Groundborne Vibration Levels.** *Project-generated groundborne vibration would not disrupt humans' activities, including sleep, or damage structures. This impact would be **less than significant**.*

Impact 3.12-5 (Alt. 5) would be similar to Impact 3.12-5 (Alt. 2). No long-term vibration sources would be created, and construction activities would be restricted to 8 a.m. to 6:30 p.m. on weekdays (and to 5 p.m. on weekends and Federal holidays). Because no recommended standards would be exceeded at nearby sensitive receptors as a result of implementing Alternative 5, the project is not anticipated to result in the exposure of sensitive receptors to excessive vibration levels. Refer to the discussion of Impact 3.12-5 (Alt. 2) for a more detailed discussion of project-generated groundborne vibration. This impact would be less than significant.

No mitigation is required.

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3.13 PUBLIC SERVICES AND UTILITIES

This section describes existing public services and utilities in the project vicinity, presents an analysis of potential project impacts, and identifies mitigation measures for those impacts determined to be significant. Utilities of potential relevance are water distribution, wastewater treatment and disposal, electrical and natural gas supply and distribution, and solid-waste collection and disposal. Public services potentially relevant to the project include law enforcement and fire protection services. Consistency with TRPA goals and policies is presented in Section 3.2, “Land Use,” Table 3.2-1. Project effects on recreational services are addressed in Section 3.8, “Recreation.” Effects on water drainage, including the construction of any stormwater drainage facilities, are addressed in Sections 3.3, “Hydrology and Flooding” and 3.4, “Geomorphology and Water Quality.” Cumulative public service and utility impacts are addressed in Section 3.16, “Cumulative Impacts.”

The information presented in this section was obtained from TRPA and El Dorado County planning documents, goals, and policies; and through consultation with representatives of the various public service and utility providers.

3.13.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

No Federal plans, policies, regulations, or laws related to public services and utilities are applicable.

State

State Responsibility Areas

Fire Protection

The California Department of Forestry and Fire Protection (CAL FIRE) implements statewide laws aimed at reducing wildfire hazards in wildland-urban interface areas. The laws are based on fire hazard assessment and zoning. The laws apply to State responsibility areas, including the study area, which are defined as areas of the state in which the State has primary financial responsibility for preventing and suppressing fires, as determined by the State Board of Forestry pursuant to Sections 4125 and 4102 of the California Public Resources Code. Fire protection outside State responsibility areas is the responsibility of Federal or local jurisdictions. These areas are referred to by CAL FIRE as Federal responsibility areas and local responsibility areas.

No other state plans, policies, regulations, or laws related to public services and utilities are applicable.

Tahoe Regional Planning Agency

1987 Regional Plan

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Code of Ordinances

Chapter 27 of the TRPA Code of Ordinances establishes standards for water, electrical, and wastewater treatment services for projects proposing a new structure, reconstruction, or expansion of an existing structure, designed or intended for human occupancy. These regulations would be applicable to those alternatives that propose to construct new structures (i.e., restrooms). Additional regulatory guidelines specific to identified public services and utilities are described below.

Water Service

Ordinance 27.3 of the TRPA Code of Ordinances contains basic water-service requirements for projects proposing a new structure, reconstruction, or expansion of an existing structure, designed or intended for human occupancy. Specifically, such projects must have adequate water rights and water supply systems. According to Ordinance 27.3B, except in specific circumstances, an adequate fire flow of 250 gallons of water per minute at 20 pounds per square inch (psi) residual pressure would be required to be available to the study area, which is classified as a conservation and recreation area by TRPA in Plan Area Statement (PAS) 119, Country Club Meadow (TRPA 2002).

Wastewater Service

Regulation 27.4 of TRPA's Code of Ordinances contains a basic wastewater-service requirement for projects proposing a new structure, or reconstruction or expansion of an existing structure, designed or intended for human occupancy. The code specifically directs that such projects that would generate wastewater be served by facilities for the treatment and export of wastewater from the Tahoe Basin. To be considered served by a facility, a service connection shall be required to transport wastewater from the parcel to a treatment plant.

To support Federal and State laws such as the Clean Water Act, Regulation 81.2C of TRPA's Code of Ordinances prohibits the discharge of domestic, municipal, or industrial wastewater to any tributary of Lake Tahoe, including the Truckee River, or to any groundwater within the region.

Electrical and Gas Service

Although TRPA does not specifically regulate the provision of electrical services in the Tahoe Basin, Chapter 27.5 of the Code of Ordinances directs that projects proposing a new structure, or reconstruction or expansion of an existing structure, designed or intended for human occupancy be served by facilities that provide adequate electrical supply. The TRPA Code of Ordinances does not include regulations specific to gas service.

Solid Waste Service

TRPA's *Regional Plan for the Lake Tahoe Basin* (Regional Plan) mandates garbage pickup service through the region and requires all solid wastes to be exported from the region (TRPA 1986: VI-3).

Fire Protection

The following goal and policy from the Natural Hazards section of TRPA Goals and Policies (TRPA 1986: II-25) related to fire risk are applicable:

GOAL 1: Risks from natural hazards (e.g., flood, fire, avalanche, earthquake) will be minimized.

- **Policy 3:** Inform residents and visitors of the wildfire hazards associated with occupancy in the basin. Encourage use of fire resistant materials and fire preventative techniques when constructing structures, especially in the highest fire hazard areas. Manage forest fuels to be consistent with state laws and other goals and policies of [the Regional] plan.

The Emergency California-Nevada Tahoe Basin Fire Commission Report (Report) was released in May 2008. In the Report there are thirty recommendations that are specific to TRPA. Within the recommendations there are 57 action items that TRPA is being encouraged to address (TBFC 2008: 73, TRPA 2008: 1). In September 2008, TRPA responded to the Report with a list of how they are implementing the 57 action items. Currently, TRPA has implemented 20 items, 15 are under implementation, and 22 under development with partner groups (TRPA 2008: 2). Action items include code changes to increase the tree removal diameter requiring a permit from 6 inches to 14 inches (diameter at breast height) and creating a "Defensible Space Assessor" definition and training program to allow fire districts to have more personnel involved in defensible space assessments. Other actions include integrating erosion control with Defensible Space requirements, developing clear, concise public messages and revised "Living With Fire" guidelines, creation of a new MOU identifying TRPA as the lead agency for vegetation management activities in the basin, creation of an MOU between TRPA and USFS to streamline forest fuels permitting, and dedicate staff to work with the Tahoe Fire and Fuels Team for expeditious permitting and public information.

Beginning April 14, 2008 all permit applications and qualified exempt declarations requiring TRPA review which involve construction must receive pre-approval from the appropriate Lake Tahoe fire protection district or department. The State lands under this project are exempt from this approval process.

TRPA Environmental Threshold Carrying Capacities

TRPA has not established any environmental threshold carrying capacities (thresholds) related to public services and utilities.

El Dorado County

El Dorado County General Plan

Chapter 5 of the *El Dorado County General Plan* stipulates that the County shall ensure that adequate public facilities and services are available to serve new development (Goal 5.1, Objective 5.1.2). The general plan also includes the provision that new development shall be required to pay its proportionate share of the costs of infrastructure improvements required to serve the project to the extent permitted by State law (El Dorado County 2004). Additional regulatory guidelines specific to identified public services and utilities are described below.

Water Service

The following policies of the *El Dorado County General Plan* related to water service are applicable:

- **Policy 5.2.1.2:** An adequate quantity and quality of water for all uses, including fire protection, shall be provided for with discretionary development.

- **Policy 5.2.3.4:** All applications for divisions of land and other discretionary or ministerial land uses which rely on groundwater for domestic use, or any other type of use, shall demonstrate that groundwater is adequate as part of the review and approval process. The County shall not approve any discretionary or ministerial projects unless the County finds, based on evidence provided by the applicant, or other evidence that may be provided, that the groundwater supply for the project in question is adequate to meet the highest demand associated with the approval in question.

Wastewater Service

The following policies of the *El Dorado County General Plan* related to wastewater service are applicable:

- **Policy 5.3.1.6:** The County shall encourage the wastewater treatment operators to design and implement future wastewater treatment capacity expansions in a manner that avoids or minimizes associated environmental impacts to the extent feasible.

- **Policy 5.3.1.7:** In Community Regions (defined as Camino/Pollock Pines, El Dorado Hills, Cameron Park, El Dorado, Diamond Springs, Shingle Springs, Georgetown, the City of Placerville and immediate surroundings, the City of South Lake Tahoe and immediate surroundings, and Meyers, Camp Richardson, Meeks Bay, and Tahoma), all new development shall connect to public wastewater treatment facilities. In Community Regions where public wastewater collection facilities do not exist project applicants must demonstrate that the proposed wastewater disposal system can accommodate the highest possible demand of the project.

Electrical and Gas Service

El Dorado County's objective in regard to electrical and gas service is to provide adequate and reliable utility services (Objective 5.6.1). Included under this objective is the goal to encourage the development of energy-efficient buildings, subdivisions, developments, and landscape designs (Objective 5.6.2). The following policies related to electrical and gas service are applicable:

- **Policy 5.6.1.1:** Promote and coordinate efforts with utilities for the undergrounding of existing and new utility distribution lines in accordance with current rules and regulations of the California Public Utility Commission and existing overhead power lines within scenic areas and existing Community Regions (see above for list of Community Regions in El Dorado County) and Rural Centers (Coloma, Cool, Fairplay, Garden Valley, Greenwood, Georgetown, Grey's Corner, Grizzly Flat, Kelsey, Kyburz, Latrobe, Little Norway, Lotus, Mosquito, Mount Ralston, Mt. Aukum, Nashville, Oak Hill, Phillips, Pilot Hill, Pleasant Valley, Quintette, Rescue, Somerset, Strawberry, and Chrome Ridge).

- **Policy 5.6.1.2:** Reserve adequate rights-of-way to facilitate expansion of services in a timely manner.

Solid Waste Service

The California Integrated Waste Management Act (Assembly Bill 939, Chapter 1095, Statutes of 1989), mandates that every city and county divert 50 percent of its waste from landfills (California Public Resources Code Section 41780). El Dorado County, in an effort to achieve this required diversion rate, has instituted the *El Dorado County Integrated Waste Management Plan.*

The following objective and policies of the *El Dorado County General Plan* related to solid waste service are applicable:

Objective 5.5.2: Recycling, Transformation, and Disposal Facilities. Ensure that there is adequate capacity for solid waste processing, recycling, transformation, and disposal to serve existing and future users in the County.

- **Policy 5.5.2.1:** Concurrent with the approval of new development, evidence will be required to show that capacity exists within the solid waste system for the processing, recycling, transformation, and disposal of solid waste.

- **Policy 5.5.2.3:** The County shall adopt a Construction and Demolition Debris Diversion Ordinance requiring that a minimum of 50 percent of the debris from construction and demolition projects be reused or recycled. The County shall encourage a higher rate of diversion.

Effective since September 2003, Chapter 8.43 of the El Dorado County Ordinance Code requires individuals or businesses demolishing or constructing projects to recycle at least half of the construction and demolition debris created.

Law Enforcement

The following policies in the Public Services and Utilities Element of the *El Dorado County General Plan* related to law enforcement are applicable:

- **Policy 5.7.3.1:** Prior to approval of new development, the Sheriff's Department shall be requested to review all applications to determine the ability of the department to provide protection services. The ability to provide protection to existing development shall not be reduced below acceptable levels as a consequence of new development. Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.

Fire Protection

The following objectives and policies of the *El Dorado County General Plan* related to public services and utilities standards are applicable:

Objective 5.7.1: Fire Protection (Community Regions). Ensure sufficient emergency water supply, storage, and conveyance facilities are available, and that adequate access is provided for, concurrent with development.

- **Policy 5.7.1.1:** Prior to approval of new development, the applicant will be required to demonstrate that adequate emergency water supply, storage, conveyance facilities, and access for fire protection either are or will be provided concurrent with development.

South Tahoe Public Utility District

South Tahoe Public Utility District (STPUD) is the utility district responsible for water and wastewater service to the study area.

Water Service

Section 3 of STPUD's administrative code specifies requirements for water service, water rates, operations, enforcement, water conservation, groundwater levels, and waterline repair.

Wastewater Service

Section 4 of STPUD's administrative code contains general provisions regarding sewer management, as well as regulations related to sewer permits; sewer type, use, and capacity specifications; sewer construction; sewer fees, rates, and schedules; and maintenance and repair of sewers. The following specifications are among those regulations that are applicable:

- **4.1.6 Right of Entry by District.** Authorized representatives of the District shall have the right of ingress to and egress from a customer's property at reasonable hours for any purpose reasonably related to this Section 4, and all Ordinances, rules, regulations, and specifications of the District duly adopted or amended.

- **4.3.10 and 4.3.11 New Construction and Remodeling, Additions and Changes of Use.** Low Water Use Plumbing Fixtures are mandatory for all new construction and for all new plumbing fixtures installed at the time of remodeling.

- **4.3.4 Control Manholes.** When required by the District, the owner of any property served by a sewer lateral carrying industrial wastes shall install a suitable control manhole to facilitate observation, sampling and measurement of wastes. Such manhole, when required, shall be accessible and safely located, and shall be constructed in accordance with plans approved by the District. The manhole shall be installed by the owner at his expense and shall be maintained by the owner so as to be safe and accessible at all times.

- **4.6.16 Construction or Location of Improvements.** Except as expressly reserved or permitted in any grant of easement or judgment in eminent domain, it shall be unlawful for any person to construct or locate improvements of any kind or type in, on or over the surface of any easement owned or acquired by the District.

ENVIRONMENTAL SETTING

Water and Wastewater Service

STPUD provides water and wastewater service to portions of El Dorado County within the Tahoe Basin, including the communities around the study area. STPUD's service area extends from U.S. Highway 89 (U.S. 89) north to Cascade Lake, from U.S. 89 south to Luther Pass, from U.S. Highway 50 (U.S. 50) east to the Nevada state line, and from U.S. 50 west to Echo Lake.

Water

STPUD's area is organized into 16 pressure zones serving more than 2.4 billion gallons annually to more than 14,000 homes and businesses. All of the water used by STPUD comes from underground aquifers. The district operates 13 active wells, and no water is taken from Lake Tahoe or any other surface-water source. There are no STPUD water lines within the study area. STPUD is funded from a variety of sources: user charges, water/sewer billings, connection fees, property tax receipts, grant monies, reimbursements from the Federal Emergency Management Agency (FEMA), and interest income.

Wastewater

STPUD operates 420 miles of sewer lines and 39 lift stations and maintains approximately 17,000 connections. Its treatment plant has a service capacity of 7.7 million gallons per day (mgd) and averages a flow of 5.0 mgd. STPUD treats approximately 1.8 billion gallons of wastewater annually.

STPUD Sewer Grid Sheets I-35–L35, I-36–K-36, and I-37–K37 show sewer lines within the study area, adjacent to the Upper Truckee River, and beneath the golf course. These sewer lines serve the Upper Truckee River and Sawmill Road neighborhoods. These lines feed into a main transport line that runs through the study area in numerous locations, crossing the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, the upstream crossing at RS 8800 is an exposed concrete encasement, both of which are inspected by STPUD twice per year (Adams, pers. comm., 2009). Additionally, a few hundred feet of sewer pipeline is located parallel to and within 25 feet of the eroding streambank on the Upper Truckee River between RS 6500 and 5900 and an existing sewer pipeline crossing of an unknown depth is located within Angora Creek. The main line goes under U.S. 50 near Elks Club Road and combines with other sewer lines from the Meyers area for transport to the treatment plant near Al Tahoe Boulevard in the City of South Lake Tahoe.

STPUD inspects manholes and flows in the area through vehicle and walk-in inspections of manholes. STPUD currently has easements to access all manholes in the system within the study area. STPUD control manholes UT 252 and UT 253 are located on either side of the river off U.S. 50 across from Elks Club Drive and are inspected monthly as part of a list of manholes that could have consequences to public health and welfare should they fail. STPUD has stated that heavy equipment of up to 1.5 tons must be able to access these manholes as often as once per year. The other manholes in the study area must also be accessible for inspection, as described per STPUD wastewater regulations (Hammond, pers. comm., 2008).

Electricity

The study area vicinity is currently served by NV Energy (NVE), which would continue to provide electric service with implementation of any of the alternatives. As a regulated utility based in Nevada, NVE is required to serve projects within its designated service area, which includes 54,500 square miles in western, central, and northeastern Nevada and northeastern California, including the Lake Tahoe area (NV Energy 2007). SPPC generates approximately 57 percent of the power it supplies. The remaining supplies are purchased on an as-needed basis.

The NVE substation nearest the study area is at the terminus of Garbage Dump Road, off Pioneer Trail. There are several access points to NVE facilities on the west side of the Upper Truckee River. Electrical line extensions exist at the ends of Cholula Street, Mushogee Street, Chilicothe Street, Ulmeca Street, Normuk Street, and West San Bernardino Drive (Matthews, pers. comm., 2006). There are no major electrical transmission lines within the study area.

Natural Gas Service

Natural gas service is proved to the communities around the study area by Southwest Gas Corporation, which purchases, transports, and distributes natural gas to residential, commercial, and industrial customers in Arizona, Nevada, and portions of California (Southwest Gas Corporation 2008). Two gas lines exist in the project vicinity. The first is a gas main that runs within the right-of-way easement of Sawmill Road, north of the study area. The second is a 2-inch gas line that runs from U.S. 50 to the golf course clubhouse on the eastern side of the study area.

Solid Waste Service

South Tahoe Refuse (STR) provides waste removal services for the South Lake Tahoe area, including the golf course. STR collects more than 100,000 tons of waste each year. This waste is collected and sorted for recycling at a material recovery facility located at the STR Transfer Station. This station has been in operation since 1995.

In 2007 STR recycled approximately 50 percent of its waste stream (58,000 tons of 130,000 tons total) though this sorting process. When applied to the State formula for diversion, the STR service area is credited with diverting more than 50 percent of solid waste from the landfill. The recycling process targets the removal of aluminum, glass, plastic, mixed paper, cardboard, wood and metals from the waste stream. Other recycling programs run by STR are the Wood Diversion Program, Construction and Demolition Program, Cardboard and Office Paper Collection Routes, and the Household Hazardous and Universal Waste Programs. STR’s recycling programs were initiated in part to encourage compliance with California’s solid-waste diversion goal of 50 percent (STR 2007).

The regional landfill utilized by STR is Lockwood Landfill, a 1,535-square-acre municipal solid-waste facility located off Interstate 80 in Storey County, Nevada, east of Sparks. The current capacity of this facility is 100+ years. Lockwood Landfill has adequate capacity to serve the project.

Telecommunications Service

AT&T provides telecommunications services including local, long distance, DSL, ISDN and T-1 lines to the Meyers area. Cable service is provided to the area by Charter Communications. These services would also be available to the study area.

Law Enforcement

California State Park Rangers

State Park Rangers are peace officers under state law with authority similar to city police or county sheriff personnel. The Rangers primary responsibility is to enforce park policies and regulations within Washoe Meadows SP and the Lake Valley SRA. The district office is located at 7360 West Lake Boulevard in Tahoma. Seven Rangers are assigned to the Sierra District, which includes several other park units; however, currently only 5 positions are filled. Response times vary due to the distance of the patrolling Ranger(s), potential road closures, and employee shortages. As of winter 2008 the State Park Rangers have added a bi-monthly patrol plan to oversee illegal winter activities occurring in the study area on top of patrolling that occurs on an as-needed or as-reported basis. Further regulatory activities have recently included an inventory of park signs and a request for additional signage to deter illegal snowmobiling within the study area. New signage will include phone numbers for reporting of illegal activities. Additionally, Rangers from Grover Hot Springs SP began assisting in patrols of the area in 2009 (Grove, pers. comm., 2008).

El Dorado County Sheriff's Department

The El Dorado County Sheriff's Department is the primary agency responsible for service calls and general crime suppression in the study area vicinity, with the exception of land owned by State Parks. The main office of the sheriff's department is located at 1356 Johnson Boulevard, South Lake Tahoe. All sheriff's department personnel serving the El Dorado County portion of the Tahoe Basin, except one resident deputy assigned to the Meeks Bay area, work out of the Johnson Boulevard location. In total, the staff at this location consists of 19 deputy sheriffs, five sergeants, and one lieutenant, for an estimated 2.5 deputies per 1,000 residents. This staffing level is greater than the service-ratio goal for the Lake Tahoe area of one officer for every 1,000 residents. This ratio is greater than the overall ratio for the El Dorado County Sheriff's Department because of the large volume of visitors that increase the population during summer and winter months or on any holiday weekend. Estimated response time to the Meyers area from a field unit is 5 minutes. A response from the Johnson Boulevard sheriff's office would take approximately 10 minutes (Lovell, pers. comm., 2006).

When contacted about the project, the Sheriff's Department expressed interest in assuring that emergency access routes (e.g., U.S. 50, North Upper Truckee Road, Apache Avenue) would be maintained during construction of any of the project alternatives. Emergency access includes creating sufficient ingress, egress, and turning angles for emergency vehicles (Lovell, pers. comm., 2008).

California Highway Patrol

The California Highway Patrol has primary jurisdiction on traffic-related matters on all roadways in the unincorporated county and on all state highways in California, including those in unincorporated areas of El Dorado County, such as U.S. 50. The highway patrol has a substation at 2063 Hopi Avenue in South Lake Tahoe, within 1 mile of the study area.

Fire Protection and Response

The Tahoe Basin is considered at high risk for catastrophic wildfire by TRPA and the area's other land use agencies (TRPA 2007: E-1). The 2007 Angora Fire burned parts of the adjacent Upper Truckee North/Tahoe Paradise neighborhood and the adjacent ridge west and north of the study area. The Angora Fire started on the afternoon of June 24, 2007 from an unattended campfire. The fire occurred during some of the most severe fire danger conditions experienced in this Basin over the last 20 years. The fire initially spread four miles in three hours and burned over 250 structures on private property, including over 200 homes. Containment required several days. Most of the 3,072 acres within the fire perimeter involved National Forest System lands; however, about 300 urban lots owned by the U.S. Forest Service (USFS), California Tahoe Conservancy, State Parks, and Eldorado County, and 231 acres of private property also burned (USFS 2007).

The fire protection districts on the California side of the Tahoe Basin have prepared a joint community wildfire protection plan (CWPP) with individual programs for each district (TBFSC 2004: I-i). In addition, in 2007 the final fuel reduction and forest restoration plan (FRFRP) was released by TRPA (TRPA 2007: E-1). This document is an example of the high priority that land use agencies in the Tahoe Basin place on wildfire protection. Both the CWPP and the FRFRP stress the high risk of wildfire, particularly high-intensity wildfire, in the Tahoe Basin and identify fuel reduction treatments as a component for reducing fire risk.

The study area is in the center of the Lake Valley Fire Protection District's (LVFPD) service area. LVFPD provides fire protection, rescue, and emergency medical services to the community of Meyers and the surrounding area, serving approximately 11,000 permanent residents, with seasonal tourist fluctuations that can increase the population to more than 40,000 persons. LVFPD employs 23 full-time and 10 volunteer personnel. LVFPD operates from three fire stations. The closest fire station to the study area is located at 2211 Keetak Street in the community of Meyers, approximately 2 miles from the study area. LVFPD maintains four Type I fire engines, two Type III fire engines, two ambulances, a rescue squad, a 3,500 gallon water tender and various other staff and utility vehicles, including a backhoe (LAFCO 2006: 144-156).

LVFPD's 2004 CWPP is part of the *Community Wildfire Protection Plan for the California Portion of the Tahoe Basin*. The CWPP for the LVFPD includes defensible-space treatments proposed for neighborhoods along North Upper Truckee Road, Meyers Community, Sawmill Road, and U.S. 50. The existing fire behavior level in the North Upper Truckee area is a National Forest Fire Laboratory (NFFL) fuel model 10. A fuel model 10 means that a fire in this area is expected to spread 300–600 feet per hour with flames 3–6 feet long. The existing predicted fire behavior in the Sawmill Road and U.S. 50 area is a NFFL fuel model 2. A fuel model 2 means that a fire in this area is expected to spread 1,300–1,700 feet per hour with flames 4–8 feet long (TBFSC et al. 2004: Chapter 2, P. 94).

Wildfire Management Plan

As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA and Washoe Meadows SP. The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas (State Parks 2006). The Lake Tahoe Golf Course is responsible for general vegetation maintenance and relies on State Parks to remove hazardous trees. Crews regularly assemble dead, fallen, and otherwise hazardous vegetation for removal (Stanowski, pers comm., 2008).

Riparian Hardwood Restoration Project

State Parks is currently implementing a Riparian Hardwood Restoration Project funded through a grant from the Reclamation on State Park land, including Washoe Meadows SP and Lake Valley SRA. The Riparian Hardwood Restoration Project involves removal of lodgepole pines along the maintenance road and adjacent to the Upper Truckee River to improve willow-alder stands; it should be completed within the study area prior to implementation of the proposed project.

3.13.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies.

CEQA

Based on Appendix G of the State CEQA Guidelines, a public services and utilities impact is considered significant if implementation of the project would do any of the following:

- result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, or emergency medical services;
- have an unplanned effect upon or result in a need for new or altered governmental services in fire protection, police protection, schools, or parks or other recreational facilities, or maintenance of public facilities, including roads, or other governmental services; or
- result in a need for new systems or substantial alterations to the power or natural gas or communication systems, use of additional water beyond permitted capacity, use of the existing sewer system beyond permitted capacity, stormwater drainage, or solid waste disposal.

NEPA

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on public services and utilities if it would:

- have an unplanned effect upon, or result in a need for new or altered governmental services in fire protection, police protection, schools, parks or other recreational facilities, or maintenance of public facilities, including roads, or other governmental services or
- result in a need for new systems or substantial alterations to the power or natural gas or communication systems, use of additional water beyond permitted capacity, use of the existing sewer beyond permitted capacity, stormwater drainage, or solid waste disposal.

METHODS AND ASSUMPTIONS

Impacts on public services and utilities that would result from implementing any of the alternatives were identified by considering if and how existing levels of service would be affected by project implementation. Evaluation of potential public service and utilities impacts was based on a review of documents pertaining to the study area, including TRPA's Code of Ordinances and the El Dorado County Code. Additional background information on current services, staffing, and equipment was obtained through consultation with appropriate agencies—specifically, Lake Valley Fire Department, El Dorado County Sheriff's Department, and California State Parks. The proposed project would comply with all applicable state and local laws.

Please refer to Section 3.14, "Human Health and Risk of Upset" for a discussion of wildfire hazard issues.

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Increased Demand on Public Services – Population growth would not result with implementation of any of the alternatives. Also, the proposed types of land uses associated with the alternatives (i.e., golf course, open space with dispersed outdoor recreation) would be the same as existing conditions, with some change in location internal to State Park property. Therefore, implementing the proposed project would not increase overall demand for public services, including fire protection, law enforcement, schools, or maintenance, that would necessitate the construction of new or altered government service facilities. No further discussion of such effects is included here; however, fire and law enforcement services are discussed in this section to the extent that implementing project alternatives could temporarily disrupt emergency access or temporarily create additional service calls related to construction. Park impacts are discussed in Section 3.8, "Recreation." Finally, no other public services, including schools, are anticipated to be affected by implementing the proposed project, because no population changes would result from any of the alternatives.

Public Utilities – Natural Gas, and Communications Systems – No changes to the natural gas or communication systems would result with implementation of any of the alternatives; therefore, these utilities are not discussed further. Effects on water, wastewater, and electrical services are discussed below. As stated in the introduction to this section, effects on water drainage, including the construction of any stormwater drainage facilities, are addressed in Section 3.4, "Geomorphology and Water Quality."

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.13-1 (Alt. 1)

Temporary Disruption of Public Services during Construction. *No construction activities or other actions that would disrupt public services would take place under Alternative 1. There would be* ***no impact****.*

Under Alternative 1, no project-related construction actions would take place, and the golf course would continue to operate as it operates today. Because no disruption would occur and no changes in demand for public services would occur, there would be no impact.

No mitigation is required.

IMPACT 3.13-2 (Alt. 1)

Temporary Disruption or Damage of Utility Services during Construction and Risk of Damage to Sewer Pipelines. *No construction activities are proposed under Alternative 1 that would disrupt utility services. However, natural geomorphic adjustments to past disturbances will increase the risk of sewer pipeline damage from continued river bed and bank erosion that could potentially damage the STPUD sewer line and release untreated wastewater to the river. Such a release could eventually reach Lake Tahoe. Implementing Alternative 1 would allow this adverse condition to persist, but it is not a change from existing conditions. Therefore, this impact would be* ***less than significant****.*

Although no construction-related disruptions of utilities would occur under Alternative 1, natural geomorphic adjustments of the Upper Truckee River to past land use disturbances would continue. The existing sewer pipeline crossing the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, and the upstream crossing at RS 8800 is an exposed concrete encasement. An existing sewer pipeline crossing is also located within Angora Creek. All of these crossings are inspected by South Tahoe Public Utility District twice per year (Adams, pers. comm., 2009). Continuation of existing channel dynamics, particularly any additional channel bed erosion in the future, may further diminish the remaining protective cover at RS 1400, potentially undercut the concrete casing at RS 8800 or the concrete casing along Angora Creek, increasing the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Additionally, a few hundred feet of sewer pipeline is located parallel to and within 25 feet of the eroding streambank on the Upper Truckee River between RS 6500 and 5900. Continuation of existing channel dynamics, particularly any additional channel widening in the future, may undermine and/or expose this section of the sewer pipeline and increase the risk of damaging effects during a major flood flow. If the sewer pipeline is damaged during a major flood, untreated wastewater could be released into the river and potentially reach Lake Tahoe.

Under Alternative 1, no change to the adverse existing conditions would be made, and risk of damage to the sewer pipelines would continue. The adverse condition would not be an effect of State Parks' implementation of Alternative 1 but would instead be related to ongoing geomorphic adjustments attributable to past human activity and land use modifications. STPUD would continue to monitor the sewer crossings twice per year and, if deemed necessary, would take protective measures and/or make repairs. While this is an adverse condition, it is no different than existing conditions and is not the result of a project action by State Parks. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.13-3 (Alt. 1)	Increased Demand for Electrical and Wastewater Service and Water Supply, Treatment, Distribution, and Storage. *Implementation of Alternative 1 would not result in increased demand for electrical, wastewater, or other water services. There would be* ***no impact****.*

Under Alternative 1, no new facilities or need for additional electrical, wastewater, or other water demands would be created. The golf course would continue to operate as it does today, and no restoration activities would occur. Because no change in demand for utility services would occur, there would be no impact.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.13-1 (Alt. 2)	Temporary Disruption of Public Services during Construction. *Construction activities and construction-related traffic could temporarily interfere with the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity. This impact would be* ***potentially significant****.*

As discussed in Section 3.10, "Transportation, Parking, and Circulation," project-related operational traffic would not substantially increase. For Alternative 2, construction-period traffic, including heavy trucks, would need to use local roads to access the project from U.S. 50. Surrounding neighborhoods, golfers, and recreationists in Washoe Meadows SP and Lake Valley SRA could be in need of public services during construction. Construction operations and off-site construction traffic could potentially interfere with the ability of public service providers, including law enforcement, fire protection, and emergency medical service providers, to reach call locations as quickly as their typical response times, because of the presence of construction vehicles on local streets and at study area access points. This impact would be potentially significant.

Mitigation Measure 3.13-1 (Alt. 2): Incorporate Public Service and Emergency Access Provisions in the Construction Traffic Management Plan.

As part of the Construction Traffic Management Plan, prepared pursuant to Mitigation Measure 3.10-3, State Parks will coordinate with the appropriate public service agencies, providing construction-related traffic details and evaluating the need for specific actions to maintain adequate public service access to the study area and surrounding vicinity during construction. The plan will include measures to inform public service agencies of access conditions, create and maintain emergency access routes for the study area and vicinity affected by project access routes, and instruct construction personnel about providing priority for public service emergency response.

Implementation of this mitigation measure would reduce impacts associated with the potential temporary disruption of public services during construction to a less-than-significant level, because adequate public service and emergency access would be maintained and public service providers would be notified about access conditions and routes.

IMPACT 3.13-2 (Alt. 2) **Temporary Disruption or Damage of Underground Utility Services during Construction and Ongoing Risk of Damage to Sewer Pipelines.** *Under Alternative 2, project excavation and grading and the potential need for relocation of or hookup to underground pipelines could disrupt existing known or unknown underground utilities. Furthermore, although the risk of damage to the sewer pipelines would be reduced relative to the No Project/No Action Alternative for some locations, it would be increased in other portions of the study area. This impact would be* ***potentially significant.***

Underground sewer and natural gas lines are located in the study area. Alternative 2 would involve excavation and grading in areas where these lines are buried and connection to electrical, sewer, and water services located in the public right-of-way for the proposed restroom. Although the probability that project construction would affect the electrical, water, and gas lines is low, the potential exists that the sewer pipeline or other unknown underground utilities would be disrupted both within the study area and within the public right-of-way. Project construction activities, including grading and excavation, could damage identified and unidentified utility equipment and facilities. Sewer lines run through several areas where grading and excavation are expected to occur for both restoration and golf course reconfiguration. Some of these lines could require relocation for project implementation.

The existing sewer pipeline crossing under the Upper Truckee River at RS 1400 is an inverted siphon that has approximately 1 foot of cover, the upstream crossing at RS 8800 is an exposed concrete encasement, and the depth of the crossing along Angora Creek is currently not known, but is not exposed. All of these crossings are inspected by STPUD twice per year (Adams, pers. comm., 2009). Alternative 2 involves installing hard grade control that increases the thickness and resistance of the channel bed over these crossings and for some distances upstream and downstream, diminishing the risk of damaging effects during a major flood flow. This would be a beneficial effect relative to existing conditions and the No Project/No Action Alternative.

With the proposed new channel alignment, the active channel would be located away from a vulnerable section of pipeline near the existing bank between RS 6500 and 5900, but it would be located near different sections of buried pipeline in two other locations. A few hundred feet of the existing sewer pipeline would be parallel to and within 25 feet of the new streambank in each of two proposed reconnected meanders, upstream of existing RS 4100 and downstream of existing RS 7900. Channel dynamics following construction, particularly any channel widening in the future, may undermine and/or expose these sections of the sewer pipeline and increase the risk of damaging effects during a major flood flow. The proposed project involves implementing bank stabilization measures, potentially using buried sheet pile between the pipeline and the river, or adjusting streambank stabilization methods, and/or relocating the reconnected channel, to prevent lateral channel migration (bank erosion) from reaching and/or undermining the existing buried pipeline. However, flood event design standards have not been established. Furthermore, changes at the mouth of Angora Creek could potentially modify the channel slope and erosive forces in the vicinity of the existing sewer crossing, particularly if streambed and streambank treatments within lower Angora Creek are not designed specifically to prevent potential headcutting that could erode the bed upstream and destabilize or threaten the existing pipelines. If the sewer pipeline is damaged during a major flood or from potential headcutting, untreated wastewater could be released into the river and potentially reach Lake Tahoe. Potential water quality effects are discussed in Section 3.4, "Geomorphology and Water Quality."

Under Alternative 2, construction and relocation of underground pipelines has the potential to disrupt existing known or unknown underground utilities. Furthermore, although the risk of damage to the sewer pipelines would be reduced relative to the No Project/No Action Alternative for some locations, it would be increased in other portions of the study area. This impact would be potentially significant.

Mitigation Measure 3.13-2a (Alt. 2): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

As part of detailed design development, State Parks will consult with applicable utility providers to determine the exact location of underground facilities in the project area, including the public right-of-way, and design the final grading plans to avoid existing utilities where possible. If these utilities cannot be avoided, State Parks shall coordinate with the applicable utility to determine the best possible course of action to minimize potential disturbance.

Before the start of construction, utility locations will be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction on the construction specifications in advance of any earthmoving activities.

Before construction begins, State Parks will provide advance notification of any needed disturbance to area businesses and residents. Utility service provider consultation will continue during construction to ensure that facilities are avoided and protected and that utility service disruptions are avoided as construction proceeds.

Before the start of construction, a response plan will be prepared to address potential accidental damage to a utility line. The plan will identify chain-of-command rules for notifying authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations will be conducted by the contractor. The response plan will be implemented by State Parks and its contractors during construction activities.

Mitigation Measure 3.13-2b (Alt. 2): Protect Vulnerable Portions of the Sewer Pipeline from the 100-Year Flood Event.

This mitigation measure is additional to Mitigation Measure 3.4-2a. During detailed design development and in coordination with STPUD, State Parks will design protections for the buried sewer pipeline north and west of the proposed reconnected meanders on the Upper Truckee River upstream of existing RS 4100 and downstream of RS 7900. Final design will include actions to prevent channel adjustments resulting from the 100-year peak event from exposing/undermining sewer pipelines. Examples of potential protective actions could include bank protection, sheet pile, or relocation of sewer pipelines. Final design schematics will be reviewed and approved by STPUD Engineering Department and the actions will be installed during project construction.

With implementation of Mitigation Measure 3.13-2a (Alt. 2) and Mitigation Measure 3.13-2b (Alt. 2) as described above, Impact 3.13-2, the potential to disrupt or damage existing utilities, would be less than significant because the project would be designed to protect utilities; utilities would be relocated with notification to neighbors; and workers would receive safety training.

IMPACT 3.13-3 (Alt. 2)	Increased Demand for Electrical and Wastewater Service and Water Supply, Treatment, Distribution, and Storage. *Implementation of Alternative 2 would result in a minor increase in demand for electrical and water services from the new restroom facility. However, irrigation demand is not expected to change. This impact would be* less than significant*.*

Implementation of Alternative 2, which includes a restroom facility on the west side of the Upper Truckee River and lighting for the parking area improvements, would result in a minor increase in electrical, water, and wastewater service. The restroom building would have one men’s and one women’s bathroom and would require an electrical, sewer, and water connection. Between six and nine lights would be added to the parking area and would be used primarily for clubhouse events. The services needed for one restroom facility and the improved parking area are minimal and would not create supply, treatment, distribution, or storage issues on the local water or electrical systems. Additionally, water needs for irrigation and other relocated facilities would be approximately the same as existing conditions through the use of improved and more efficient irrigation practices and equipment. Water supply related to irrigation is discussed in further detail in Section 3.4, "Geomorphology and Water Quality." Irrigation use would not increase water demand above current golf course use levels. Restored floodplain and riparian vegetation would need temporary irrigation; however, this use would be seasonal, short term, and not sufficient enough to increase water demand beyond that available. This impact would be less than significant.

No mitigation is required.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.13-1 (Alt. 3) **Temporary Disruption of Public Services during Construction.** *Construction activities and construction-related traffic could temporarily interfere with the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity. This impact would be* ***potentially significant****.*

This impact is identical to Impact 3.13-1 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.13-1 (Alt. 3): Incorporate Public Service and Emergency Access Provisions in the Construction Traffic Management Plan.

This mitigation measure is identical to Mitigation Measure 3.13-1 (Alt. 2).

Implementation of this mitigation measure would reduce impacts associated with temporary disruption of public services during construction to a less-than-significant level because public service providers would be notified and detours would be provided where potential access issues may occur.

IMPACT 3.13-2 (Alt. 3) **Temporary Disruption or Damage of Underground Utility Services during Construction and Ongoing Risk of Damage to Sewer Pipelines.** *Under Alternative 3, project excavation and grading and the potential need for relocation of underground pipelines could disrupt existing known or unknown underground utilities. Furthermore, although the risk of damage to the sewer pipelines would be reduced relative to the No Project/No Action Alternative for some locations, it would be increased in other portions of the study area. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.13-2 (Alt. 2) because both alternatives involve construction activities that could affect the provision of utility services to the project vicinity. However, no new restroom facility, parking upgrades, or grading on the west side of the river is proposed under Alternative 3, so there would be no need for utility connections. Sewer lines could potentially need to be relocated because of restoration grading, and the risk of damage to the sewer lines during large flood events still exists. Therefore, this impact would be potentially significant.

Mitigation Measure 3.13-2a (Alt. 3): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is identical to Mitigation Measure 3.13-2a (Alt. 2).

Mitigation Measure 3.13-2b (Alt. 3): Protect Vulnerable Portions of the Sewer Pipeline from the 100-Year Flood Event.

This mitigation measure is identical to Mitigation Measure 3.13-2b (Alt. 2).

For the same reasons as described for Alternative 2, with implementation of Mitigation Measure 3.13-2a (Alt. 3) and Mitigation Measure 3.13-2b (Alt. 3), Impact 3.13-2 (Alt. 3), the potential to disrupt or damage existing utilities, would be less than significant because the project would be designed to avoid or protect utilities, utilities would be relocated with notification to neighbors, and workers would receive safety training.

IMPACT 3.13-3 (Alt. 3)	**Increased Demand for Electrical and Wastewater Service and Water Supply, Treatment, Distribution, and Storage.** *Implementation of Alternative 3 would result in a minor decrease in water demand and would have no effect on electrical or water services. This impact would be **less than significant**.*

Implementation of Alternative 3, at buildout, would result in a minor decrease in water demand because the proposed project includes an upgraded and more efficient irrigation system and because the extent of intensively managed areas that are regularly irrigated would decrease and the extent of minimally managed areas that are not irrigated would increase. There would be no effect on electrical, water, or wastewater services as a result of implementing Alternative 3 because a restroom facility and lighting for the improved parking area are not proposed. Water supply related to irrigation is discussed in further detail in Section 3.4, "Geomorphology and Water Quality." Restored floodplain and riparian vegetation would need temporary irrigation; however, this use would be seasonal, short term, and not sufficient enough to increase water demand beyond that available. This impact would be less than significant.

No mitigation is required.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.13-1 (Alt. 4)	**Temporary Disruption of Public Services during Construction.** *Construction activities and construction-related traffic could temporarily interfere with the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity. This impact would be **potentially significant**.*

This impact is identical to Impact 3.13-1 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.13-1 (Alt. 4): Incorporate Public Service and Emergency Access Provisions in the Construction Traffic Management Plan.

This mitigation measure is identical to Mitigation Measure 3.13-1 (Alt. 2).

Implementation of this mitigation measure would reduce impacts associated with temporary disruption of public services during construction to a less-than-significant level because public service providers would be notified and detours would be provided where potential access issues may occur.

IMPACT 3.13-2 (Alt. 4)	**Temporary Disruption or Damage of Underground Utility Services during Construction and Ongoing Risk of Damage to Sewer Pipelines.** *Implementing Alternative 4 would improve existing protective cover over sewer pipelines crossing the Upper Truckee River, and where lines are located within 25 feet of the existing banks, banks would be stabilized to reduce future erosion toward those lines. However, under Alternative 4, project excavation and grading and the potential need for relocation of underground pipelines could disrupt existing known or unknown underground utilities. This impact would be **potentially significant**.*

This impact is similar to Impact 3.13-2 (Alt. 2) because both alternatives involve construction activities that could affect the provision of utility services to the project vicinity, including construction of a new restroom facility and paving and lighting of the parking area. However, under Alternative 4, project grading would be much less than under Alternative 2 because no grading would occur on the west side of the river and because the floodplain would not be modified, new channel sections would not be created, and former meanders would not be incorporated under this alternative; therefore, the probability of damaging or needing to relocate utilities is lower. River stabilization measures implemented under this alternative would improve cover over the existing sewer line crossings and reduce potential damage to the sewer lines both at the crossings and adjacent to the river. River stabilization measures would have a beneficial effect on existing sewer lines across and adjacent to the Upper Truckee River.

Although grading and excavation would be much less than under the other action alternatives, the potential to damage existing sewer lines would still exist. Under Alternative 4, the restroom facility would be connected to the existing sewer, electrical, and water lines located in the public right-of-way, as well as electrical hookup for parking lot improvements. Therefore, this impact would be potentially significant.

Mitigation Measure 3.13-2a (Alt. 4): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is identical to Mitigation Measure 3.13-2a (Alt. 2).

Mitigation Measure 3.13-2b (Alt. 4): Protect Vulnerable Portions of the Sewer Pipeline from the 100-Year Flood Event.

This mitigation measure is identical to Mitigation Measure 3.13-2b (Alt. 2).

For the same reasons as described for Alternative 2, with implementation of Mitigation Measure 3.13-2a (Alt. 4) and Mitigation Measure 3.13-2b (Alt. 4), Impact 3.13-2 (Alt. 4), the potential to disrupt or damage existing utilities, would be less than significant because the project would be designed to avoid or protect utilities, utilities would be relocated with notification to neighbors, and workers would receive safety training.

IMPACT 3.13-3 (Alt. 4)	Increased Demand for Electrical and Wastewater Service and Water Supply, Treatment, Distribution, and Storage. *Implementation of Alternative 4 would result in a minor increase in demand for electrical and water services from the new restroom facility and the parking area improvements. However, irrigation demand is not expected to change. This impact would be* ***less than significant****.*

Implementation of Alternative 4, which includes the proposed restroom facility near hole 5 and lighting for the parking area improvements, would result in a minor increase in electrical, water, and wastewater service. The restroom building would have one men's and one women's bathroom and would require an electrical, sewer, and water connection. Between six and nine additional lights would be added to the parking area and would be used primarily for clubhouse events. The services needed for one restroom facility and the parking area improvements are minimal and would not create supply, treatment, distribution, or storage issues on the local water or electrical systems.

Under Alternative 4, irrigation equipment would not be upgraded, and water needs for irrigation would be approximately the same as under existing conditions. Water supply related to irrigation is discussed in further detail in Section 3.4, "Geomorphology and Water Quality." Restored floodplain and riparian vegetation would need temporary irrigation; however, this use would be seasonal, short term, and not sufficient enough to increase water demand beyond that available. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.13-1 (Alt. 5) **Temporary Disruption of Public Services during Construction.** *Construction activities and construction-related traffic could temporarily interfere with the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity. This impact would be **potentially significant**.*

This impact is identical to Impact 3.13-1 (Alt. 2). For the same reasons as described for Alternative 2, this impact would be potentially significant.

Mitigation Measure 3.13-1 (Alt. 5): Incorporate Public Service and Emergency Access Provisions in the Construction Traffic Management Plan.

This mitigation measure is identical to Mitigation Measure 3.13-1 (Alt. 2).

Implementation of this mitigation measure would reduce impacts associated with temporary disruption of public services during construction to a less-than-significant level because public service providers would be notified and detours would be provided where potential access issues may occur.

IMPACT 3.13-2 (Alt. 5) **Temporary Disruption or Damage of Underground Utility Services during Construction and Ongoing Risk of Damage to Sewer Pipelines.** *Under Alternative 5, project excavation and grading and the potential need for relocation of underground pipelines could disrupt existing known or unknown underground utilities if not properly coordinated with service providers. Furthermore, although the risk of damage to the sewer pipelines would be reduced relative to the No Project/No Action Alternative for some locations, it would be increased in other portions of the study area. This impact would be **potentially significant**.*

This impact is similar to Impact 3.13-2 (Alt. 2) because both alternatives involve construction activities that could affect the provision of utility services to the project vicinity. However, no new restroom facility or grading on the west side of the river is proposed under this alternative, so there would be no need for utility connections, and the existing golf course would be decommissioned. Sewer lines could potentially need to be relocated because of restoration grading, and the risk of damage to the sewer lines during large flood events would still exist. Therefore, this impact would be potentially significant.

Mitigation Measure 3.13-2a (Alt. 5): Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage.

This mitigation measure is identical to Mitigation Measure 3.13-2a (Alt. 2).

Mitigation Measure 3.13-2b (Alt. 5): Protect Vulnerable Portions of the Sewer Pipeline from the 100-Year Flood Event.

This mitigation measure is identical to Mitigation Measure 3.13-2b (Alt. 2).

For the same reasons as described for Alternative 2, with implementation of Mitigation Measure 3.13-2a (Alt. 5) and Mitigation Measure 3.13-2b (Alt. 5), Impact 3.13-2 (Alt. 5), the potential to disrupt or damage existing utilities, would be less than significant because the project would be designed to avoid or protect utilities, utilities would be relocated with notification to neighbors, and workers would receive safety training.

IMPACT 3.13-3 (Alt. 5) **Increased Demand for Electrical and Wastewater Service and Water Supply, Treatment, Distribution, and Storage.** *Implementation of Alternative 5 would result in a decrease in water demand and would have no effect on electrical or other water services. This impact would be **less than significant**.*

Implementation of Alternative 5, at buildout, would likely result in a decrease in water demand because the proposed project includes removing golf course infrastructure, including golf course irrigation equipment, and replacing it with native vegetation. After initial native vegetation is established, these vegetated areas would no longer be irrigated; therefore, implementing Alternative 5 would result in a decreased demand on water supply. However, State Parks plans to evaluate alternative land uses within the Washoe Meadows State Park and the SRA in a separate planning process. Demand needs, use of the well, and storage facilities will be evaluated at that time. It is not expected that any increase in water supply, treatment, distribution, or storage would be required. Water would still be used at the clubhouse in a manner similar to its use today for landscaping, restrooms, and other clubhouse facilities. This impact would be less than significant.

No mitigation is required.

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3.14 HUMAN HEALTH AND RISK OF UPSET

This section evaluates the potential risks to human health and the risk of upset from hazardous materials, fire hazards, hazards to aviation, and public health impacts associated with implementation of the Upper Truckee River Restoration and Golf Course Reconfiguration Project. This section describes the regulatory background and existing environmental conditions in the study area and identifies potential impacts of the proposed alternatives and mitigation measures that would reduce those impacts to less-than-significant levels. Consistency with TRPA goals and policies is presented in Section 3.2, “Land Use,” Table 3.2-1. Cumulative human health and risk of upset impacts are addressed in Section 3.16, “Cumulative Impacts.”

3.14.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Numerous Federal, State, and regional laws, rules, regulations, plans, and policies define the framework for regulating human health and risk of upset, including hazardous materials, in the Tahoe Basin. The following discussion summarizes hazardous materials and other public health and safety requirements applicable to this project.

Federal

Management of Hazardous Materials

Federal laws require planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and if such materials are accidentally released, to prevent or mitigate injury to health or the environment. The U.S. Environmental Protection Agency (EPA) is the agency primarily responsible for enforcement and implementation of Federal laws and regulations pertaining to hazardous materials. Applicable Federal regulations pertaining to hazardous materials are contained mainly in Code of Federal Regulations (CFR) Titles 29, 40, and 49. Hazardous materials, as defined in the code, are listed in 49 CFR 172.101. Management of hazardous materials is governed by the following laws:

- The Resource Conservation and Recovery Act of 1976 (RCRA) (42 United States Code [USC] 6901 et seq.) is the law under which EPA regulates hazardous waste from the time the waste is generated until its final disposal (“cradle to grave”).

- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also called the Superfund Act) (42 USC 9601 et seq.) gives EPA authority to seek out parties responsible for releases of hazardous substances and ensure their cooperation in site remediation.

- The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499; USC Title 42, Chapter 116), also known as SARA Title III or the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.

Transport of Hazardous Materials

The U.S. Department of Transportation regulates transport of hazardous materials between states and is responsible for protecting the public from dangers associated with such transport. The Federal hazardous materials transportation law, 49 USC 5101 et seq. (formerly the Hazardous Materials Transportation Act, 49 USC 1801 et seq.), is the basic statute regulating transport of hazardous materials in the United States. Hazardous materials regulations are enforced by the Federal Highway Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration (FAA).

Hazardous Waste Management

The RCRA (EPA 2006) requires a comprehensive regulatory system for handling hazardous waste in a manner that protects human health and the environment. This regulatory system includes tracking all generators of hazardous waste.

Worker Safety

The Federal Occupational Safety and Health Administration (OSHA) is the agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 9 USC 651 et seq.). OSHA has adopted numerous regulations pertaining to worker safety, contained in CFR Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials.

Airspace Safety

Part 77 of the Federal Aviation Regulations (FAR), “Objects Affecting Navigable Airspace,” has been adopted to help ensure that the airspace required for safe operation of aircraft and airports is monitored and protected. Objects that exceed certain specified height limits constitute airspace obstructions. FAR Section 77.13 requires that FAA be notified of proposed construction or alteration of certain objects within a specified vicinity of an airport, including the following:

(1) Any construction or alteration of more than 200 feet in height above the ground level at its site.

(2) Any construction or alteration of greater height than an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each public-use airport, public-use airport under construction, or military airport, with at least one runway more than 3,200 feet in actual length, excluding heliports.

Wildlife Hazards

Collisions between aircraft and wildlife compromise the safety of passengers and flight crews. Damage to an aircraft resulting from a wildlife collision can range from a small dent in the wing to catastrophic engine failure and destruction of the aircraft, along with potential loss of life.

FAA is responsible for enforcing 14 CFR 139, which prescribes rules regarding operation of airports used by aircraft with seating capacity of more than 30 passengers. FAA roles and responsibilities relating to wildlife hazards and their associated human health and safety concerns are addressed in 14 CFR 139.337, Wildlife Hazard Management. An ecological study must be prepared by the airport operator and submitted to FAA when multiple birds or other wildlife are struck by aircraft or ingested into aircraft engines, or if sufficient birds or other wildlife are present in an airport flight pattern as to result in such hazards. FAA determines whether a wildlife hazard management plan is needed. FAA’s Office of Airport Safety and Standards has published advisory circulars and program policy and guidance directives that further clarify this information. An advisory circular dated July 27, 2004, titled “Hazardous Wildlife Attractants on or Near Airports” (AC 150/5200-33A), provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. FAA recommends the following separations when siting facilities that would increase wildlife attractants (e.g., municipal landfills, wastewater treatment facilities, or constructed wetlands) (FAA 2004):

- 5,000 feet from airports serving piston-powered aircraft,

- 10,000 feet from airports serving turbine-powered aircraft, and

- 5 miles from airports where the wildlife attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

FAA recommends a distance of 10,000 feet (critical zone) separating wildlife attractants and aircraft movement areas. Table 3.14-1 lists wildlife groups ranked by FAA based on the hazard they pose to aircraft and flight (FAA 2007). Hazard ranking of species groups is based on the sum of three criteria, each given a value: the incident of a wildlife strike, the extent of the damage, and effect to the flight associated with the wildlife strike. Deer are the most damaging species group, and thus are given a relative hazard score of 100. The remaining hazardous species group's relative hazard score is a percentage of the deer's total score.

Table 3.14-1
Species Group and Federal Aviation Administration Hazard Ranking

Species Group	Rank	Relative Hazard Score
Deer	1	100
Vultures	2	64
Geese	3	55
Cormorants/pelicans	4	54
Cranes	5	47
Eagles	6	41
Ducks	7	39
Osprey	8	39
Turkey/pheasants	9	33
Herons	10	27
Hawks (buteos)	11	25
Gulls	12	24
Rock pigeons	13	23
Owls	14	23
Horned lark	15	17
Crows/ravens	16	16
Coyote	17	14
Mourning dove	18	14
Shorebirds	19	10
Blackbirds/starling	20	10
American kestrel	21	9
Meadowlarks	22	7
Swallows	23	4
Sparrows	24	4
Nighthawks	25	1

Source: FAA 2007

State

Management of Hazardous Materials

In California, both Federal and State community right-to-know laws are coordinated through the Governor's Office of Emergency Services. The Federal law, SARA Title III or EPCRA, is described above under the listing of Federal regulations. The corresponding State law is Chapter 6.95 of the California Health and Safety Code.

The purpose of EPCRA is to encourage and support emergency planning efforts at the State and local levels and to provide local governments and the public with information about potential chemical hazards in the communities. Because of the community right-to-know laws, information is collected from facilities that handle (e.g., produce, use, store) hazardous materials above certain quantities. The provisions of EPCRA apply to four major categories:

- emergency planning,
- emergency release notification,
- reporting of hazardous chemical storage, and
- inventory of toxic chemical releases.

Information gathered in these four categories help Federal, State, and local agencies and communities get an idea of the chemical hazards in a particular location or area and what chemicals individual facilities are using, storing, or producing on-site.

The California Department of Toxic Substances Control (DTSC), a division of the California Environmental Protection Agency, has primary regulatory responsibility over hazardous materials in California, working in conjunction with EPA to enforce and implement hazardous-materials laws and regulations. As required by Section 65962.5 of the California Government Code, DTSC maintains a hazardous waste and substances site list for the State, called the Cortese List.

Transport of Hazardous Materials and Hazardous Materials Emergency Response Plan

State agencies with primary responsibility for enforcing State regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation (Caltrans). Together, these agencies determine container types used and license hazardous-waste haulers for to transport hazardous waste on public roads.

California has developed an emergency response plan to coordinate emergency services provided by Federal, State, and local governments and private agencies. Response to hazardous materials incidents is one part of this plan. The plan is managed by the Governor's Office of Emergency Services, which coordinates the responses of other agencies—in the study area, the California Environmental Protection Agency, the California Highway Patrol, the California Department of Fish and Game, the Lahontan Regional Water Quality Control Board (Lahontan RWQCB), the El Dorado County Environmental Management Department, the El Dorado County Sheriff's Department, and the Lake Valley Fire Protection District.

Worker Safety

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are more stringent than Federal OSHA regulations and are presented in Title 8 of the California Code of Regulations. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Airspace Safety

The State regulates airports under the authority of the Airport Land Use Commission Law, Section 21670 et seq. of the California Public Utilities Code. The *California Airport Land Use Planning Handbook* published by the Caltrans Division of Aeronautics (Caltrans 2002) supports this law by providing compatibility planning guidance to airport land use commissions (ALUCs), counties and cities that have jurisdiction over airport area land uses, and airport proprietors.

The Airport Land Use Commission Law is implemented through ALUCs, which are required in every county with a public-use airport or with an airport served by a scheduled airline. Under the provisions of the law, the ALUC has certain responsibilities and specific duties. Among these are preparing airport land use plans for each of the airports within its jurisdiction (California Public Utilities Code, Sections 21674[c] and 21675[a]). El Dorado County has designated TRPA as the ALUC for the Lake Tahoe Airport.

Wildfire Hazard Management

State Responsibility Areas

The California Department of Forestry and Fire Protection (CAL FIRE) implements statewide laws aimed at reducing wildfire hazards in wildland-urban interface areas. The laws are based on fire hazard assessment and zoning. The laws apply to State responsibility areas, including the study area, which are defined as areas of the state in which the State has primary financial responsibility for preventing and suppressing fires, as determined by the State Board of Forestry pursuant to Sections 4125 and 4102 of the California Public Resources Code. Fire protection outside State responsibility areas is the responsibility of Federal or local jurisdictions. These areas are referred to by CAL FIRE as Federal responsibility areas and local responsibility areas.

Wildfire Management Plan

As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA (H. Lake Valley State Recreation Area) and Washoe Meadows SP (G. Washoe Meadows State Park). The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas (State Parks 2006). The Lake Tahoe Golf Course is responsible for general vegetation maintenance and relies on State Parks to remove hazardous trees. Crews regularly collect dead, fallen, and otherwise hazardous vegetation for removal (Stanowski, pers. comm., 2008).

Tahoe Regional Planning Agency

1987 Regional Plan

TRPA implements its authority to regulate growth and development in the Lake Tahoe region through the *Regional Plan for the Lake Tahoe Basin* (Regional Plan). TRPA's Regional Plan, adopted in 1987, consists of several documents: Goals and Policies, Code of Ordinances, Water Quality Management Plan, Regional Transportation Plan—Air Quality Plan, Plan Area Statements, and Scenic Quality Improvement Plan.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The following policy in Chapter II (Land Use Element) of TRPA's Goals and Policies related to hazards and hazardous materials is applicable to this project:

> **Natural Hazards, Goal 1, Policy 3:** Inform residents and visitors of the wildfire hazard associated with occupancy in the Basin. Encourage use of fire resistant materials and fire preventative techniques when constructing structures, especially in the highest fire hazard areas. Manage forest fuels to be consistent with state laws and other goals and policies of this plan.

Code of Ordinances

Section IX, Chapter 75, Section 75.3 of the TRPA Code of Ordinances (TRPA 2008) provides the following guidance applicable to the proposed alternatives related to hazards and hazardous materials:

> **Vegetation Management to Prevent the Spread of Wildfire:** Within areas of significant fire hazard, as determined by local, state, or federal fire agencies, flammable or other combustible vegetation may be removed, thinned, or manipulated up to 30 feet from any structure to prevent the spread of wildfire. Sufficient quantities of residual vegetation should remain in this 30-foot-wide zone to stabilize the soil and prevent erosion. Whenever possible, vegetation in this zone should be thinned, tapered, cut back, or otherwise selectively manipulated, rather than removed entirely. Revegetation with approved species may be required where vegetative ground cover has been eliminated or where erosion problems may occur.

The Emergency California-Nevada Tahoe Basin Fire Commission Report (Report) was released in May 2008. In the Report there are thirty recommendations that are specific to TRPA. Within the recommendations there are 57 action items that TRPA is being encouraged to address (TBFC 2008: 73, TRPA 2008: 1). In September 2008, TRPA responded to the Report with a list of how they are implementing the 57 action items. Currently, TRPA has implemented 20 items, 15 are under implementation, and 22 under development with partner groups (TRPA 2008: 2). Action items include code changes to increase the tree removal diameter requiring a permit from 6 inches to 14 inches (diameter at breast height) and creating a "Defensible Space Assessor" definition and training program to allow fire districts to have more personnel involved in defensible space assessments. Other actions include integrating erosion control with Defensible Space requirements, developing clear, concise public messages and revised "Living With Fire" guidelines, creation of a new MOU identifying TRPA as the lead agency for vegetation management activities in the basin, creation of an MOU between TRPA and USFS to streamline forest fuels permitting, and dedicate staff to work with the Tahoe Fire and Fuels Team for expeditious permitting and public information.

Beginning April 14, 2008, all permit applications and qualified exempt declarations requiring TRPA review which involve construction must receive pre-approval from the appropriate Lake Tahoe fire protection district or department. State lands, including those within the study area are exempt from this approval process.

TRPA Environmental Threshold Carrying Capacities

TRPA has not established any environmental threshold carrying capacities (thresholds) related to human health/risk of upset.

El Dorado County Vector Control District

In 1915, the California Legislature adopted the Mosquito Abatement Act (now incorporated into Division 3, Chapter 5 of the Health and Safety Code), which formed the basis for the creation, function, and governing powers of mosquito abatement districts. The El Dorado County Vector Control District (EDCVCD) was formed in 1963. EDCVCD is a division of the El Dorado County Environmental Management Department. EDCVCD's service area encompasses 195 square miles, including the study area, and its mission is to provide vector control services and protect public health and safety with minimal impact on the environment (El Dorado County 2008).

Mosquito abatement/vector control districts are governmental organizations formed at the local level that are responsible for controlling specific disease vectors within their jurisdiction. They have the authority to conduct surveillance for, prevent the occurrence of, and abate production of vectors on both public and private properties. Vector control districts also have the authority to participate in review, comment, and make recommendations regarding Federal, State, or local land use planning and environmental quality processes, documents, permits, licenses, and entitlements for projects and their potential effects on vector production. These districts receive most of their revenue from property taxes and are primarily responsible for controlling mosquitoes as pest species and as disease vectors. California law requires that if a problem source of mosquito production exists as a result of human-made conditions, the party responsible for those conditions is liable for the cost of abatement.

City of South Lake Tahoe

The *Lake Tahoe Airport Comprehensive Land Use Plan* (CLUP) establishes planning boundaries for the Lake Tahoe Airport and defines compatible types and patterns of future land uses that might occur in the area surrounding the airport (City of South Lake Tahoe 2007). The purpose of the CLUP is to provide the Lake Tahoe Airport area with compatibility guidelines for height, noise, and safety.

The CLUP designates airport safety zones to the land surrounding the airport. To minimize the number of people exposed to aircraft crash hazards, land use restrictions are enforced in these safety zones. The CLUP designates three safety zones:

- the clear zone, which is near the runway and is the most restrictive;
- the approach/departure zone, which is located under the takeoff and landing slopes for each runway, extends outward for 5,000 feet from Runway 36 (with a width of 500–1,500 feet) and 10,000 feet from Runway 18 (with a width of 1,010–3,500 feet), and is less restrictive than the clear zone; and
- the overflight zone, which is the area overflown by aircraft during the normal traffic pattern, extends in all directions 5,000 feet from the center of each end of each runway, and is the least restrictive.

A small portion of the northeast corner of the study area, adjacent to Sawmill Road and U.S. 50 (RM 1000 to U.S. 50) is within the overflight zone.

ENVIRONMENTAL SETTING

Definitions

For purposes of this section, the term “hazardous materials” refers to both hazardous substances and hazardous wastes. A “hazardous material” is defined by Federal regulations as “a substance or material that…is capable of posing an unreasonable risk to health, safety, and property when transported in commerce” (49 CFR 171.8). Section 25501 of the California Health and Safety Code defines a hazardous material as follows:

> Hazardous material means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Hazardous wastes are defined in Section 25141(b) of the Health and Safety Code as wastes that:

> …because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness[, or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Land Uses and Site Conditions

Potential Sources of Hazardous Materials in the Vicinity of the Study Area

The study area has been altered from its original condition as a result of human activities: logging, livestock grazing, road construction, a rock quarry, and residential and commercial developments. Therefore, human-generated hazardous wastes could exist within the study area. A former quarry site is located on the west side of the Upper Truckee River within the SP, within the area proposed as golf course under Alternative 2. Most of the viable sand and gravel was excavated from the site prior to State Parks ownership. The north and south lobe both contain concrete, brick, and asphalt waste, while the middle lobe has been restored. No leaking underground storage tanks or other designated cleanup sites were identified within or near the study area (SWRCB 2008). There are no known Superfund sites within the Lake Tahoe Basin. According to EPA's Envirofacts database, EnviroMapper, and a 2007 survey of the study area, four small-quantity generators are located near the study area (EPA 2005, 2007). Such entities produce between 220 and 2,200 pounds of hazardous waste per month. The following locations have been designated as small-quantity generators:

- Sierra Ready Mix, 1526 Emerald Bay Road
- 5 Star Texaco, 2037 U.S. 50
- Shell Service Station, U.S. 50 at Santa Fe
- Executive Aero Systems, U.S. 50 at Apache Avenue

Potential Sources of Hazardous Materials in the Study Area

Maintained Hazardous Materials

The Lake Tahoe Golf Course is enrolled in a hazardous waste generator and hazardous materials management plan program with the El Dorado County Environmental Management Department. This program includes a hazardous materials business plan and annual hazardous materials safety training for golf course staff members. The El Dorado County Environmental Management Department performs inspections that include photographic documentation and materials sampling.

The following hazardous materials are maintained on-site at the golf course:

- fertilizer;
- herbicide;
- fungicide;
- vehicle maintenance and fueling chemicals:
    - one 55-gallon drum containing used oil filters;
    - two 500-gallon aboveground storage tanks, one containing unleaded gasoline and one containing diesel fuel; and
    - up to two 55-gallon drums of oil for snowmobile use is on-site.

Existing golf course operations are conducted under an updated waste discharge permit and associated monitoring and reporting program from Lahontan RWQCB (Lahontan RWQCB 2000a, 2000b). For the purposes of Board Order No. 6-00-48, State Parks (as landowner) and American Golf (as lease holder) are considered as “the discharger,” and the golf course and its routine operation and maintenance are referred to as “the facility.” Before the 2000 update, the facility operated under Board Order No. 6-89-9, which was adopted on January 12, 1989. The waste discharge requirements for the facility include compliance with discharge limitations and receiving water limitations consistent with the Basin Plan. In compliance with the updated permit, the golf course prepared a maintenance plan that included a “chemical plan, an irrigation plan, an agronomic plan, an erosion control plan, and reporting requirements” (Lake Tahoe Golf Course and Restaurant 2000). Potential pollutants from the facility consists of nutrients from fertilizers and toxic compounds from the use of pesticides, products of erosion, construction waste materials, and small amounts of oil and grease contained in stormwater runoff from impervious surfaces, diesel fuel, and gasoline fuel from the two aboveground fuel tanks and the former underground tanks (Lahontan RWQCB 2000a).

A review of the Lahontan RWQCB’s files identified the closure of an underground storage tank, case number 6T0113A (Lahontan RWQCB 1993). The underground storage tank was located where the existing maintenance building currently stands and was removed before the building was constructed. A letter dated September 9, 1993, from the Lahontan RWQCB to golf course superintendent John Stanowski stated that lab results showed no detectable contaminants in soil samples, monitoring wells, or purge water. The letter stated that the case was closed.

Violations and Notices

During the winter months, the Lake Tahoe Winter Sports Center operates a snowmobile rental company at the Lake Tahoe Golf Course. Complaint number 6-99-20 was filed by the Lahontan RWQCB against Lake Tahoe Winter Sports Center in 1999. A discharge occurred on or about February 22, 1999, when a fuel line on a snowcat at the site was damaged and an unknown quantity of diesel fuel (less than 30 gallons) was discharged to the snow adjacent to the maintenance building. Diesel fuel was observed entering the stormwater detention pond on April 19, 1999, and to the Upper Truckee River on April 20, 1999. It is noted that diesel fuel may have also discharged as overland flow to the Upper Truckee River for an unknown period of time. The soil was excavated and confirmation soil samples were evaluated for diesel and other potential constituents of concern. The May 12, 1999, sampling results were nondetect for TPDd (diesel). Excavated soil was disposed of at Forward Landfill in Manteca, California (Avalex Inc. 1999:1). Since the spill, the El Dorado County Environmental Management Department has determined that the spill has been remediated, and no further action is required (Morgan, pers. comm., 2002).

The Lake Tahoe Golf Course received a notice of correction from the El Dorado County Environmental Management Department for spills of used oil on soil near its golf cart/vehicle maintenance and fueling facility on April 26, 2005. On May 31, 2005, an inspection report noted that the contaminated soil was cleaned and required no further action (Martin, 2005a, 2005b).

Schools within One-Quarter Mile of the Study Area

Appendix G of the State CEQA Guidelines recommends that an EIR consider whether a project might emit or handle hazardous materials within one-quarter mile of an existing or proposed school.

One school, Lake Tahoe Environmental Science Magnet School, exists within one-quarter mile of the study area. No additional schools are proposed within one-quarter mile of the study area.

Wildlife Hazards to Aviation

The Lake Tahoe Airport, owned and operated by the City of South Lake Tahoe, is located approximately 1 mile northeast of the northeast corner of the study area. The airport is equipped to serve as a commercial air carrier/general aviation airport, although it does not currently support commercial flights and there is no commercial operator at the airport. The airport has one north-south asphalt runaway, which is 8,544 feet long by 150 feet wide.

The Lake Tahoe Airport is adjacent to the Upper Truckee River and to the corridor of aquatic, wetland, riparian, and upland habitats that extends from upstream of the airport through South Lake Tahoe to the lake. The airport's location in this corridor, its proximity to Lake Tahoe, and the extensive areas of natural vegetation nearby create the potential for hazardous wildlife to move through the airport's clear, approach/departure, and overflight zones.

The study area provides habitat for several species groups that can be hazardous to aviation (FAA 2007). Section 3.5, "Biological Resources (Fisheries and Aquatic Resources, Vegetation and Wildlife)," provides additional information on the wildlife within the study area. Habitat for these species groups is provided not only in the study area, but also outside of the study area in a large portion of the clear, approach/departure, and overflight zones, and in most of the 10,000-foot wide critical zone (within which FAA recommends minimizing attractants of hazardous wildlife). Despite the presence of extensive habitat for hazardous wildlife in its vicinity, bird-plane collisions (i.e., bird strikes) have not been a problem at the Lake Tahoe Airport. There are no records of bird strikes at the Lake Tahoe Airport in the FAA Birdstrike Database or within the memory of airport staff members (CDM 2007).

Wildland Fire Hazards

The Tahoe Basin is considered at high risk for catastrophic wildfire by TRPA and the area's other land use agencies (TRPA 2007: E-1). The 2007 Angora Fire burned parts of the adjacent Upper Truckee North/Tahoe Paradise neighborhood and the adjacent ridge west and north of the study area. The Angora Fire started on the afternoon of June 24, 2007 from an unattended campfire. The fire occurred during some of the most severe fire danger conditions experienced in this Basin over the last 20 years. The fire initially spread 4 miles in 3 hours and burned over 250 structures on private property, including over 200 homes. Containment required several days. Most of the 3,072 acres within the fire perimeter involved USFS lands; however, about 300 urban lots owned by the USFS, Conservancy, State Parks, and Eldorado County, and 231 acres of private property also burned (USFS 2007).

The fire protection districts on the California side of the Tahoe Basin have prepared a joint community wildfire prevention plan (CWPP) with individual programs for each district (TBFSC 2004: I-i). In addition, in 2007 the final fuel reduction and forest restoration plan (FRFRP) was released by TRPA (TRPA 2007: E-1). This document is an example of the high priority that land use agencies in the Tahoe Basin place on wildfire prevention. Both the CWPP and the FRFRP stress the high risk of wildfire, particularly high-intensity wildfire, in the Tahoe Basin and identify fuel reduction treatments as a component for reducing fire risk.

The Emergency California-Nevada Tahoe Basin Fire Commission Report was released in May 2008. Beginning April 14, 2008, all permit applications and qualified exempt declarations requiring TRPA review which involve construction must receive pre-approval from the appropriate Lake Tahoe fire protection district or department. The State lands of the study area are exempt from this approval process. The study area is in the center of the Lake Valley Fire Protection District's (LVFPD) service area. LVFPD provides fire protection, rescue, and emergency medical services to the community of Meyers and the surrounding area, serving approximately 11,000 permanent residents, with seasonal tourist fluctuations that can increase the population to more than 40,000 persons. LVFPD employs 23 full-time and 10 volunteer personnel. LVFPD operates from three fire stations. The closest fire station to the study area is located at 2211 Keetak Street in the community of Meyers, approximately 2 miles from the study area. LVFPD maintains four Type I fire engines, two Type III fire engines, two ambulances, a rescue squad, a 3500 gallon water tender and various other staff and utility vehicles, including a backhoe (LAFCO 2006: 144-156).

LVFPD's 2004 CWPP is part of the *Community Wildfire Protection Plan for the California Portion of the Tahoe Basin*. The CWPP for the LVFPD includes defensible-space treatments proposed for neighborhoods along North Upper Truckee Road, Meyers Community, Sawmill Road, and U.S. 50. The existing fire behavior level in the North Upper Truckee area is a National Forest Fire Laboratory (NFFL) fuel model 10. A fuel model 10 means that a fire in this area is expected to spread 300–600 feet per hour with flames 3–6 feet long. The existing predicted fire behavior in the Sawmill Road and U.S. 50 area is a NFFL fuel model 2. A fuel model 2 means that a fire in this area is expected to spread 1,300–1,700 feet per hour with flames 4–8 feet long (TBFSC et al. 2004: Chapter 2, P. 94).

As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA and Washoe Meadows SP. The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas. The *Lake Sector Wildfire Management Plan* provides resource information and fire suppression tactics for both Washoe Meadows SP and Lake Valley SRA (Table 3.14-2). In general, the Lake Tahoe Golf Course relies on staff members and visitors to make management aware of vegetation that requires removal. State Parks removes trees within the golf course that are determined to be hazardous (Stanowski, pers. comm., 2008). Formal tree hazard inspections are performed on a 2-year return interval by the State Parks Forester, following state-wide protocol.

Table 3.14-2
Lake Sector Wildfire Management Plan

Location	Potential Safe Areas	Defensive Fuel Profile Zones/Prescribed Burn History	Sensitive Resources to Protect	Suppression Tactics
Washoe Meadows State Park	Wet meadows with green vegetation; along the Upper Truckee River	Defensive Fuel Profile Zone along the western boundary of the park	Meadow, fen, riparian areas	Minimum impact suppression tactics
Lake Valley State Recreation Area	Golf course greens; wet meadows with green vegetation	Vegetation maintenance (completed by golf course)	Meadow, riparian areas	Minimum impact suppression tactics

Notes: Minimum impact suppression tactics include hand crews and handlines only if absolutely necessary. Bulldozers/vehicles and drops of fire retardant in the meadows, fen, and riparian areas are not permitted.
Source: State Parks 2006

State Parks is currently implementing a Riparian Hardwood Restoration Project funded through a grant from the Reclamation on State Park land, including Washoe Meadows SP and Lake Valley SRA. The Riparian Hardwood Restoration Project should be completed within the study area prior to implementation of the proposed project. It involves removal of lodgepole pines along the maintenance road and adjacent to the Upper Truckee River to improve alder, aspen, and willow stands.

Mosquito Hazards

Mosquito Ecology

The life cycle of the mosquito consists of four stages: egg, larva, pupa, and adult (CDPH 2008:5–8). The egg, larva, and pupa stages are completed in calm, standing water in permanent, seasonal, or intermittent waters, including seasonal and permanent wetlands, and even small isolated waters such as drying pools of ephemeral drainages, tire ruts, and artificial containers. Larvae hatch from eggs in water and feed on organic matter and microorganisms, such as bacteria. Fish and predatory insects feed on mosquito larva, and greatly reduce their abundance in permanent bodies of water. The pupa stage lasts several days, during which the larva changes into an adult. Seasonal and environmental conditions determine the length of time it takes for larval mosquitoes to complete their development; some species develop faster than others under the same conditions. Depending on average temperatures, it may take from 4 days to a month for the mosquito to mature from egg to adult; with warmer temperatures, development accelerates.

Adults may remain close to where they hatched or may disperse from several hundred yards to several miles, depending on the species (Walton 2003:2, ACMAD 2000:1). Most adult females live for about 2 weeks, although some may survive longer, and those that emerge late in the season may hibernate through the winter to begin laying eggs in the spring. Female mosquitoes require meals of blood for protein, so that they can produce eggs (CDPH 2008:5). Hosts that can supply blood include reptiles, amphibians, mammals (including humans), and birds. Predators of adult mosquitoes include a variety of bird and bat species, and invertebrates such as dragonflies will also prey on adult mosquitoes. Various fish species or predatory aquatic macroinvertebrates will prey on mosquito eggs and larvae. Wildlife species and their habitats, including predators of mosquitoes, are discussed in detail in Section 3.5, "Biological Resources." Common mosquitoes in the Tahoe Basin include species in the genus *Aedes*, which breed in the standing water that results from melting snow; species in the genus *Culiseta*, which breed in ponds, basins, and human-made containers; and *Culex tarsalis*, the "encephalitis mosquito," which can transmit to humans viruses that can cause encephalitis (an inflammation of the brain) (EDCDEM 2008). The immature stages of *C. tarsalis* can develop in almost any standing freshwater (Bohart and Washino 1978:131–132).

All mosquito species are potential vectors of organisms that can cause disease to pets, domestic animals, wildlife, or humans (El Dorado County 2007). Public concern regarding West Nile virus, a disease transmitted to humans by mosquitoes (including *C. tarsalis*), has increased since the virus was first detected in the United States in 1999. A mosquito first acquires West Nile virus by feeding on a bird with the virus in its blood. Most people and animals that are infected with the virus have mild or no symptoms. In rare cases, the virus can cause encephalitis. The first evidence of West Nile virus in California was in 2003 and in El Dorado County in 2004 (EDCDEM 2008). West Nile virus has recently been detected in the vicinity of the study area (Huber, pers. comm., 2007).

Mosquito Control

The study area is within EDCVCD's monitoring zone, and most of the study area is recognized as a breeding ground for mosquitoes (Huber, pers. comm., 2007). Riparian areas naturally have depressions, oxbows and areas of seasonal standing water, and the golf course has several ponds. EDCVCD does not treat the Lake Tahoe Golf Course ponds. EDCVCD technicians do identify and monitor mosquito breeding sources at least every 2 weeks from March through September within the Tahoe Basin. In years of especially heavy precipitation, some areas of the study area are especially prone to being inundated with standing water for long periods of time. Larvacides have been applied to standing water bodies within the study area. Treatments contain either methoprene, which mimics an insect growth hormone to prevent development of adult mosquitoes, or the bacterium *Bacillus thuringiensis israelensis,* which produces toxins that target mosquito larvae and other insects. The type and quantity of larvacide used are regulated by the California Department of Pesticide Regulation.

3.14.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies. There are no Environmental Threshold Carrying Capacities for human health and risk of upset.

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, an impact on hazards and/or hazardous materials is considered significant if implementation of an alternative would do any of the following:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- for a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area; B/impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on hazards and/or hazardous materials if it would:

- involve a risk of explosion or the release of hazardous substances,
- create a health hazard or potential health hazard, or
- expose people to potential health hazards.

METHODS AND ASSUMPTIONS

This analysis considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from the project alternatives and identifies the primary ways that these hazardous materials could expose individuals or the environment to health and safety risks. As discussed above, compliance with applicable Federal, State, and local health and safety laws and regulations by residents and businesses in the vicinity of the study area would generally protect the health and safety of the public. Local and State agencies would be expected to continue to enforce applicable requirements to the extent that they do so now.

The following reports documenting potential hazardous conditions in the study area were reviewed for this analysis:

- applicable land use plans;
- available literature, including documents published by city, county, State, and Federal agencies;
- applicable elements from the El Dorado County General Plan;
- applicable elements from the City of South Lake Tahoe Comprehensive Land Use Plan; and
- applicable elements from the Lake Tahoe Airport Draft Preliminary Wildlife Assessment.

The information obtained from these sources was reviewed and summarized to establish existing conditions and to evaluate the significance of potential environmental effects, based on the criteria presented above. In determining the level of significance, this analysis assumes that development in the project site would comply with relevant Federal, State, regional, and local ordinances and regulations.

IMPACTS FOUND NOT TO BE SIGNIFICANT AND NOT DISCUSSED FURTHER

Hazardous Materials Sites – There are no hazardous materials sites subject to compliance with Government Code Section 65962.5 in the study area.

Emergency Plans – No alternatives would impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan.

Private Airstrip – There are no private airstrips in the vicinity of the study area.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action: Existing River and 18-Hole Regulation Golf Course

IMPACT 3.14-1 (Alt. 1)	Use of Hazardous Materials. *Alternative 1 would involve the storage, use, and transport of hazardous materials to and within the study area for general golf course operations, emergency repairs, and fuels management; however, there would be no change in use relative to existing conditions.* ***No impact*** *would occur.*

Under Alternative 1, on-site construction and operational equipment would continue to operate as it does today (e.g., for golf course mowing, fuels management); thus, the use of hazardous materials would be unchanged compared to current conditions. Emergency construction may be conducted as necessary; however, the nature and extent of these activities are unknown and would not be a direct result of implementing Alternative 1.

As described in the "Environmental Setting" section, above, the Lake Tahoe Golf Course is enrolled in a hazardous waste generator and hazardous materials management plan program with the El Dorado County Environmental Management Department. This program includes a hazardous materials business plan and annual hazardous materials safety training for golf course staff members. The El Dorado County Environmental Management Department performs inspections that include photographic documentation and materials sampling. Operations are also conducted under an updated waste discharge permit and associated monitoring and reporting program from Lahontan RWQCB (Lahontan RWQCB 2000a, 2000b).

Fuels management is conducted by a licensed State Parks forester under Wildfire Management Plan. Because future conditions under Alternative 1 would remain comparable to current conditions with regard to potential exposure to hazardous materials. No impact would occur.

No mitigation is required.

IMPACT 3.14-2 (Alt. 1) **Potential Human Health Hazards from Exposure to Existing On-Site Hazardous Materials.** *Alternative 1 could expose workers to hazardous materials present on-site during emergency repairs or spot treatment activities, and hazardous materials on-site could create an environmental or health hazard if left in place. This impact would be* ***less than significant****.*

Under Alternative 1, no land use changes would occur. In the study area, future conditions with regard to exposure to existing on-site hazardous materials would be comparable to current conditions. Spills known to have occurred within the study area have been remediated to the satisfaction of the Lahontan RWQCB and the El Dorado County Environmental Management Department. There is a potential for golf course employees, construction workers, or others to encounter unknown or undocumented hazardous materials while performing tasks related to emergency repairs along the Upper Truckee River or spot repairs on irrigation lines. However, the nature and extent of these activities are unknown and would not be a direct result of implementing Alternative 1. This impact would be less than significant.

No mitigation is required.

IMPACT 3.14-3 (Alt. 1) **Potential for Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School.** *One school is located within one-quarter mile of the study area. Alternative 1 would involve the handling of hazardous materials or acutely hazardous materials within the study area for general golf course operations, emergency repairs, and ongoing fuels management; however, there would be no change in use relative to existing conditions. This impact would be* ***less than significant****.*

Under Alternative 1, on-site construction and operational equipment would continue to operate as it does today (e.g., for golf course mowing, fuels management); thus, the use of hazardous materials would be unchanged compared to current conditions. Emergency construction would be conducted as necessary; however, the nature and extent of these activities are unknown and would not be a direct result of implementing Alternative 1. The potential for hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste would be comparable to current conditions. This impact would be less than significant.

No mitigation is required.

IMPACT 3.14-4 (Alt. 1) **Increased Exposure to Wildland Fire Hazard.** *Alternative 1 would not result in any change to existing conditions as they relate to the risk of wildland fire hazard.* ***No impact*** *would occur.*

The Lake Valley SRA and Washoe Meadows SP have adopted a Wildfire Management Plan that would continue to be in effect under Alternative 1. Implementing Alternative 1 would not result in any changes to existing conditions as they relate to wildland fire, and ongoing fuels management would remain the same. No impact would occur.

No mitigation is required.

IMPACT 3.14-5 (Alt. 1) **Potential to Result in More Frequent Collisions between Aircraft and Wildlife at Lake Tahoe Airport.** *Implementing Alternative 1 would not result in any changes in land use that could result in more frequent collisions between aircraft and wildlife at Lake Tahoe Airport. This impact would be* ***less than significant****.*

Under Alternative 1, land use changes would not occur in the study area. The golf course would remain in its current configuration, and no restoration activities would occur. Future conditions with regard to wildlife that could be hazardous to aircraft would be comparable to current conditions. The FAA considers golf courses and wetlands to be landscape types that attract wildlife that may be hazardous to aviation. However, open space and golf courses are considered compatible land uses in Airport Safety Area 3 in the Lake Tahoe Airport CLUP (City of South Lake Tahoe 2007). As described in the "Environmental Setting" section, above, there are no records of bird-related air strikes in the FAA Birdstrike Database, and no airport staff members recall any bird-related air strikes (CDM 2007). The likelihood of wildlife-aircraft accidents associated with the Lake Tahoe Airport is considered low. Because an increase in wildlife-related hazards under Alternative 1 is unlikely and the proposed land uses in Airport Safety Area 3 under Alternative 1 are compatible with the CLUP, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-6 (Alt. 1)	Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation. *Implementing Alternative 1 would not result in changes to the study area, so it could not result in a greater abundance of mosquitoes. Future conditions in the study area would be comparable to current conditions.* ***No impact*** *would occur.*

Much of the study area is recognized by EDCVCD as a breeding ground for mosquitoes; thus, the district monitors the abundance of mosquito larvae in the study area and implements treatments to control mosquitoes as necessary. Riparian areas naturally have depressions, oxbows, and areas of seasonal standing water, and the golf course has several ponds. Because implementing Alternative 1 would not change the existing conditions with regard to mosquito breeding habitat. No impact would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.14-1 (Alt. 2)	Use of Hazardous Materials. *Alternative 2 would involve the storage, use, and transport of hazardous materials to and within the study area during construction activities and for general golf course operations. However, use of hazardous materials at the site would be in compliance with Federal, State, and local regulations, including existing orders. Therefore, impacts related to creation of significant hazards to the public through routine transport, storage, use, and disposal would be* ***less than significant.***

Construction and operational activities under Alternative 2 would involve the storage, use, and transport of hazardous materials (e.g., fuels). Construction activities would involve changes to the existing golf course areas, construction of new golf course areas, removal of golf course infrastructure adjacent to the Upper Truckee River, removal of bridges and installation of a replacement bridge, and construction and modifications to the river channel and floodplain surfaces. These activities would involve the use of construction vehicles and equipment, such as transport trucks, dump trucks, dozers, excavators, loaders, water trucks, forklifts, ton pickup trucks, chainsaws, and tub grinders. Transport vehicles would be refueled primarily off-site; however construction equipment may be refueled and serviced on-site, which would require the use and transport of fuels and lubricants.

Transportation of hazardous materials on area roadways is regulated by the California Highway Patrol and Caltrans, whereas use of these materials is regulated by the DTSC, as outlined in CCR Title 22. State Parks, its contractors, and golf course concessionaires would be required to use, store, and transport hazardous materials in compliance with Federal, State, and local regulations during project construction and operation.

As described in the "Environmental Setting" section, above, existing golf course operations are conducted under an updated waste discharge permit (Board Order No. 6-00-48) and the associated monitoring and reporting program from Lahontan RWQCB (Lahontan RWQCB 2000a, 2000b). In compliance with the updated permit, the golf course prepared a maintenance plan that included a "chemical plan, an irrigation plan, an agronomic plan, an erosion control plan, and reporting requirements" (Lake Tahoe Golf Course and Restaurant 2000). Potential pollutants from the facility consist of nutrients from fertilizers; toxic compounds from the use of pesticides;

products of erosion; construction waste materials; and small amounts of oil and grease contained in stormwater runoff from impervious surfaces, diesel fuel, and gasoline fuel from the two aboveground fuel tanks and the former underground tanks (Lahontan RWQCB 2000a).

As described in Chapter 2, "Project Alternatives," BMPs currently in place to manage stormwater runoff in the parking and maintenance areas would remain in place. Grassy areas on both sides of the golf course entrance are used for parking, and under Alternative 2, this area would be paved to create an additional 89 parking spaces. Additional BMPs, including a second oil separator and slotted channel drains, would be incorporated into the existing management system. The aboveground storage of gas and diesel would continue as it is today.

Because the project would comply with existing hazardous materials regulations and incorporate additional BMPs into the parking area improvements, impacts related to creation of significant hazards to the public through routine transport, use, disposal, and risk of upset would be less than significant.

No mitigation is required.

IMPACT 3.14-2 (Alt. 2)	Potential Human Health Hazards from Exposure to Existing On-Site Hazardous Materials. *Implementing Alternative 2 could expose workers to hazardous materials present on-site during construction activities, and hazardous materials on-site could create an environmental or health hazard if left in place. This impact would be* ***potentially significant****.*

Spills known to have occurred in the study area have been remediated to the satisfaction of the Lahontan RWQCB and the El Dorado County Environmental Management Department. However, there is a chance that unknown or undocumented hazardous materials could be present in construction areas, including within the current golf course boundary and golf course relocation area (i.e., within the former Anderson Quarry area). Excavation at or near areas of currently unrecorded soil and/or groundwater contamination could result in the exposure of construction workers, the general public, and the environment to hazardous materials, such as petroleum hydrocarbons, pesticides, herbicides, fertilizers, contaminated debris, or elevated levels of other chemicals that could be hazardous. This impact would be potentially significant.

Mitigation Measure 3.14-2 (Alt. 2): Implement Measures to Reduce the Risk of Health Hazards Associated with Potential Exposure to Hazardous Substances.

If evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) is encountered during construction activities, the construction contractor will immediately stop work in that area and notify State Parks. State Parks will notify the appropriate Federal, State, and local agencies and will ensure that any contaminated areas are cleaned up in accordance with recommendations made by the El Dorado County Environmental Management Department, Lahontan RWQCB, DTSC, or other appropriate Federal, State, or local regulatory agencies as generally described above before authorizing work to continue in the area.

Implementing this mitigation measure would reduce potentially significant impacts associated with exposure of unknown hazardous materials within the study area to a less-than-significant level because hazardous substances that are encountered would be evaluated, removed, and properly disposed of in accordance with Federal, State, and local regulations as necessary.

IMPACT 3.14-3 (Alt. 2) **Potential for Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School.** *One school is located within one-quarter mile of the study area. Alternative 2 would involve the handling of hazardous materials or acutely hazardous materials within the study area during construction, general golf course operations, and fuels management. This impact would be* ***potentially significant****.*

Restoration and operational activities would involve the use of potentially hazardous materials, such as fuels (gasoline and diesel), oils, and lubricants that are commonly used in construction projects and golf course operations. Implementation of Alternative 2 would include relocating part of the golf course to the west side of the river. River restoration activities and a portion of the relocated golf course would be within one-quarter mile of Lake Tahoe Environmental Science Magnet School. In addition, it is possible that undocumented contaminated soil or water may be found during construction activities, especially in the area of the former quarry, where a dump site of concrete and brick is known to exist. Therefore, this impact would be potentially significant.

Mitigation Measure 3.14-3 (Alt. 2): Notify Applicable School District with Jurisdiction over Schools within One-Quarter Mile of Project Construction Activities.

As required by Public Resource Code Section 21151.4, State Parks shall provide written notification of the project to the Lake Tahoe Unified School District and the Lake Tahoe Environmental Science Magnet School at least 30 days before certification of the EIR/EIS/EIS and shall consult with the school district and Lake Tahoe Environmental Science Magnet School regarding the potential impacts on schoolchildren associated with hazards from project implementation.

Implementation of this mitigation measure would reduce potentially significant impacts associated with hazardous materials emissions within one-quarter mile of a school to a less-than-significant level because the notification and consultation process satisfies the requirements of Public Resource Code Section 21151.4.

IMPACT 3.14-4 (Alt. 2) **Increased Exposure to Wildland Fire Hazard.** *Implementing Alternative 2 would increase the size of the golf course footprint and would seasonally increase the amount of human activity in the proposed new golf course area on the west side of the Upper Truckee River. The increase in human presence during the fire season could result in an increased risk of fire; however, golf course watering and vegetation management, combined with the removal of fuels for existing fire management and to construct the golf course, would reduce this impact. This impact would be* ***less than significant****.*

State Parks and the golf course concessionaire are responsible for vegetation management in the Washoe Meadows SP and Lake Valley SRA. Implementing Alternative 2 would increase the golf course footprint; however, the landscape would receive frequent water application and vegetation management that would serve to reduce the risk of wildland fires. Furthermore, areas of lodgepole pine stands with high levels of surface fuels, ladder fuels, and a dense contiguous canopy layer would be removed in the area on the west side of the river proposed as golf course, allowing additional emergency access to the west side of the river. Furthermore, Washoe Meadows SP and Lake Valley SRA have adopted a Wildfire Management Plan that would continue to be followed before, during, and after the proposed project is implemented. Because the Wildfire Management Plan includes methods of fire prevention and suppression and the project would reduce the amount of combustible fuels on the west side of the river, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-5 (Alt. 2) **Potential to Result in More Frequent Collisions between Aircraft and Wildlife at Lake Tahoe Airport.** *Alternative 2 would include floodplain and meadow restoration in Airport Safety Area 3. The Lake Tahoe Airport CLUP considers open space and watershed improvement projects compatible land uses in Airport Safety Area 3. This impact would be* ***less than significant****.*

The FAA considers golf courses and wetlands to be a landscape types that attract wildlife that may be hazardous to aviation. Alternative 2 includes relocation of seven complete and two partial holes, which would increase the southern and western extent of the Lake Tahoe Golf Course. Alternative 2 also includes restoration of meadow and floodplain in the northern part of the study area, a portion of which is in Airport Safety Area 3. The existing golf course and river are an attractant to wildlife that could potentially pose a hazard to aircraft. The proposed changes to the golf course would move a portion of the golf course out of the airport safety area and restore meadow and floodplain in that area. Watershed improvements and open space are considered compatible land uses in Airport Safety Area 3 in the Lake Tahoe Airport CLUP (City of South Lake Tahoe 2007). Restoration activities would improve the quality of existing habitat but would not increase the amount of habitat considered an attractant to wildlife and would not appreciably increase the amount of wildlife using the area. As described in the "Environmental Setting" section, above, there are no records of bird-related air strikes in the FAA Birdstrike Database, and no airport staff members recall any bird-related air strikes (CDM 2007). With or without project implementation, the likelihood of wildlife-aircraft accidents associated with the Lake Tahoe Airport is considered low. Because an increase in wildlife-related hazards under Alternative 2 is unlikely and the proposed land uses in Airport Safety Area 3 under Alternative 2 are compatible with the CLUP, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-6 (Alt. 2) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation.** *Implementing Alternative 2 would result in more extensive floodplain inundation that could result in greater abundance of mosquitoes and thus greater potential for exposure of people to mosquito-borne viruses. This impact would be* ***potentially significant****.*

Much of the study area is recognized by EDCVCD as a breeding ground for mosquitoes; thus, the district monitors the abundance of mosquito larvae in the study area and implements treatments to control mosquitoes as necessary. In some years, Alternative 2 would increase the extent and frequency of floodplain inundation (e.g., the active [5-year] floodplain would be increased by approximately 43 acres). Furthermore, a 1.6 acre pond is proposed on the west side of the river and off-channel oxbows would be created in backfilled channels, while other existing oxbows would be re-connected to the river. The additional pond and inundation expected may increase the extent of calm, standing water in dense vegetation and thus could increase or enhance breeding habitat for mosquitoes. However, habitat for mosquito predators such as birds and bats would also be improved. Because implementing Alternative 2 could increase mosquito abundance and the potential for exposure of people to mosquito-borne viruses. This impact would be potentially significant.

Mitigation Measure 3.14-6 (Alt. 2): Establish and Implement a Management Agreement with the El Dorado County Vector Control District.

State Parks will establish and implement a management agreement with EDCVCD. As a performance criterion for the management agreement, the terms and conditions of the agreement will be designed to ensure that EDCVCD can maintain mosquito abundance at or below pre-project levels. The agreement will include but not be limited to:

- measures that ensure necessary access for monitoring and control measures;
- applicable best management practices from the California Department of Public Health's *Best Management Practices for Mosquito Control on California State Properties* (CDPH 2008), including:

- implementing procedures for coordinating State Parks and EDCVCD management activities, including procedures for golf course ponds; and

- providing public information for visitors and the community regarding control measures being implemented, the risk of transmission of mosquito-borne disease, and personal protective measures.

Implementation of this mitigation measure would reduce potentially significant impacts associated with increased exposure of the public to mosquito-borne viruses to a less-than-significant level because the establishment and implementation of the management agreement would ensure that EDCVCD maintains mosquito abundance at or below pre-project levels.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.14-1 (Alt. 3)	Use of Hazardous Materials. *Alternative 3 would involve the storage, use, and transport of hazardous materials within the study area during construction activities, golf course operations, and ongoing fuels management. However, use of hazardous materials at the site would be in compliance with Federal, State, and local regulations. Therefore, during construction, impacts related to creation of significant hazards to the public through routine transport, storage, use, disposal, and risk of upset would not occur. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.14-1 (Alt. 2) because hazardous materials would continue to be used on the golf course and during construction; however, the golf course would not be reconfigured under this alternative, so hazardous materials would be used only within the current footprint of the golf course, for restoration purposes, and ongoing nonproject-related fuels management.

No mitigation is required.

IMPACT 3.14-2 (Alt. 3)	Potential Human Health Hazards from Exposure to Existing On-Site Hazardous Materials. *Implementing Alternative 3 could expose workers to hazardous materials present on-site during construction activities, and hazardous materials on-site could create an environmental or health hazard if left in place. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-2 (Alt. 2) because construction and operational activities under Alternative 3 would involve changes to the existing golf course areas, removal of golf course infrastructure adjacent to the Upper Truckee River, removal of bridges, and construction and modifications to the river channel and floodplain surfaces. These activities would involve grading that could potentially expose unknown hazardous materials. However, construction activities would not occur in the area of the former quarry on the west side of the river. Any unknown hazardous materials associated with that area would not be exposed or disturbed during construction.

Mitigation Measure 3.14-2 (Alt. 3): Implement Measures to Reduce the Risk of Health Hazards Associated with Potential Exposure to Hazardous Substances.

This mitigation measure is identical to Mitigation Measure 3.14.2 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-2 (Alt. 3), Impact 3.14-2 (Alt. 3) would be less than significant.

IMPACT 3.14-3 (Alt. 3) **Potential for Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School.** *One school is located within one-quarter mile of the study area. Alternative 3 would involve the handling of hazardous materials or acutely hazardous materials within the study area during construction, general golf course operations, and existing fuels management. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-3 (Alt. 2) because under Alternative 3 construction activities along the Upper Truckee River and floodplain would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School. However, the golf course would not be relocated to the west side of the river. Because construction activities would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School, this impact would be potentially significant.

Mitigation Measure 3.14-3 (Alt. 3): Notify Applicable School District with Jurisdiction over Schools within One-Quarter Mile of Project Construction Activities.

This mitigation measure is identical to Mitigation Measure 3.14-3 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-3 (Alt. 3), Impact 3.14-3 (Alt. 3) would be less than significant.

IMPACT 3.14-4 (Alt. 3) **Increased Exposure to Wildland Fire Hazard.** *Implementing Alternative 3 would reduce the size of the golf course footprint and would restore portions of the Upper Truckee River. The smaller golf course would reduce human presence in the area, thus reducing the risk of fire. Restoring meadows and floodplains would not result in an increase in fire hazard relative to existing conditions. This impact would be* ***less than significant****.*

State Parks and the golf course concessionaire are responsible for vegetation management in Washoe Meadows SP and Lake Valley SRA. Implementing Alternative 3 would decrease the golf course footprint and the number of holes and would restore the meadow and floodplain formerly occupied by golf course, adjacent to the Upper Truckee River. The economic study prepared for the project (HEC 2008 [Appendix E]) predicts that between 8,000 and 18,000 fewer rounds of golf would be played annually under this alternative compared with current use. The reduced amount of human activity at the golf course would result in a decreased risk of wildland fire relative to existing conditions. The restored floodplain generally would have conditions similar to or wetter than existing irrigated conditions; therefore, there would not be an increase in fire hazard. Additionally, Washoe Meadows SP and Lake Valley SRA have adopted a Wildfire Management Plan that would continue to be followed before, during, and after implementation of Alternative 3. Because the Wildfire Management Plan includes methods of fire prevention and suppression and the project would reduce the human presence at the golf course, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-5 (Alt. 3) ***Potential to Result in More Frequent Collisions between Aircraft and Wildlife at Lake Tahoe Airport.*** *Alternative 3 would include restoration of floodplain and meadow in Safety Area 3 and decommissioning of a portion of the golf course. The Lake Tahoe Airport CLUP considers open space and watershed improvement projects compatible land uses in Airport Safety Area 3. This impact would be* ***less than significant****.*

Alternative 3 involves restoring areas of the Upper Truckee River and floodplain both within and outside of Airport Safety Area 3 and reducing the footprint of the golf course. Watershed improvements and open space are considered compatible land uses within Airport Safety Area 3, as discussed above. The proposed restoration activities would improve habitat quality but are not expected to result in an increase in the amount of wildlife using the study area. Of the wildlife present in the study area, waterfowl (geese and ducks) pose the greatest threat to aircraft. The golf course is considered a wildlife attractant, particularly for waterfowl, and reducing the golf course footprint and restoring part of the golf course to meadow and floodplain would not appreciably change the attractiveness of the study area to waterfowl. As described in the "Environmental Setting" section, above, there are no records of bird-related air strikes in the FAA Birdstrike Database, and no airport staff members recall any bird-related air strikes (CDM 2007). With or without project implementation, the likelihood of wildlife-aircraft accidents associated with the Lake Tahoe Airport is considered low. Because an increase in wildlife-related hazards under Alternative 3 is unlikely and the proposed land uses in Airport Safety Area 3 under Alternative 3 are compatible with the CLUP, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-6 (Alt. 3)	Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation. *Implementing Alternative 3 would result in more extensive floodplain inundation compared with current conditions, which could result in greater abundance of mosquitoes; therefore, there would be greater potential for exposure of people to mosquito-borne viruses. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-6 (Alt. 2) areas adjacent to the Upper Truckee River that were formerly occupied by golf course will become restored floodplain and wetland area (approximately 41 additional acres). However, the golf course would be reduced in size, there would be fewer ponds on the remaining golf course. The ponds on the existing golf course are not treated by EDCVCD. Although implementation of Alternative 3 would reduce the area of untreated standing water on the golf course, the former golf course area would become wetland and restored floodplain, increasing the total active floodplain area by 41 acres, with additional standing water in off-channel oxbows created within backfilled channel sections. This increase in the area of standing water could result in an increase in the abundance of mosquitoes and thus increase the potential for exposure of people to mosquito-borne viruses. This impact would be potentially significant.

Mitigation Measure 3.14-6 (Alt. 3): Establish and Implement a Management Agreement with the El Dorado County Vector Control District.

This mitigation measure is identical to Mitigation Measure 3.14-6 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-6 (Alt. 3), Impact 3.14-6 (Alt. 3) would be less than significant.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.14-1 (Alt. 4)	Hazardous Materials and Public Health—Use of Hazardous Materials. *Alternative 4 would involve the storage, use, and transport of hazardous materials to and within the study area during construction activities, golf course operations, and ongoing fuels management. However, use of hazardous materials at the site would be in compliance with Federal, State, and local regulations. Therefore, impacts related to creation of significant hazards to the public through routine transport, storage, use, disposal, and risk of upset would not occur. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.14-1 (Alt. 2) because hazardous materials would be used during construction and would continue to be used on the golf course; however, the golf course would not be reconfigured under this alternative, so hazardous materials would be used only within the current footprint of the golf course, for restoration purposes, and on-going non-project related fuels management.

No mitigation is required.

IMPACT 3.14-2 (Alt. 4) **Potential Human Health Hazards from Exposure to Existing On-Site Hazardous Materials.** *Implementing Alternative 4 could expose workers to hazardous materials present on-site during construction activities, and hazardous materials on-site could create an environmental or health hazard if left in place. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-2 (Alt. 2) because construction activities under Alternative 4 would involve modifications to the river channel and localized floodplain surfaces. These activities would involve grading that could potentially expose unknown hazardous materials. However, construction activities would not occur in the area of the former quarry on the Westside of the river. Any unknown hazardous materials associated with that area would not be exposed or disturbed during construction under Alternative 4.

Mitigation Measure 3.14-2 (Alt. 4): Implement Measures to Reduce the Risk of Health Hazards Associated with Potential Exposure to Hazardous Substances.

This mitigation measure is identical to Mitigation Measure 3.14-2 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-2 (Alt. 4), Impact 3.14-2 (Alt. 4) would be less than significant.

IMPACT 3.14-3 (Alt. 4) **Potential for Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School.** *One school is located within one-quarter mile of the study area. Implementing Alternative 4 would involve the handling of hazardous materials or acutely hazardous materials in the study area during construction. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-3 (Alt. 2) because under Alternative 4 construction activities along the Upper Truckee River and floodplain would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School. However, the golf course would not be relocated to the west side of the river and the river would be stabilized in place. Because construction activities would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School, this impact would be potentially significant.

Mitigation Measure 3.14-3 (Alt. 4): Notify Applicable School District with Jurisdiction over Schools within One-Quarter Mile of Project Construction Activities.

This mitigation measure is identical to Mitigation Measure 3.14-3 (Alt. 2). As described under Alternative 2, with implementation of Mitigation Measure 3.14-3 (Alt. 4), Impact 3.14-3 (Alt. 4) would be less than significant.

IMPACT 3.14-4 (Alt. 4) **Increased Exposure to Wildland Fire Hazard.** *Implementing Alternative 4 would restore portions of the Upper Truckee River and leave the golf course in its existing configuration. The future conditions under Alternative 4 with regard to wildfire risk would be the same as existing conditions. This impact would be* ***less than significant****.*

Under Alternative 4, the golf course would remain in its current configuration, and the river would be stabilized in place. Implementing Alternative 4 would result in only minor changes in the landscape relative to existing conditions. Additionally, Washoe Meadows SP and Lake Valley SRA have adopted a Wildfire Management Plan that would continue to be followed before, during, and after implementation of Alternative 4. Because the Wildfire Management Plan includes methods of fire prevention and suppression and implementing the project would result in minor changes to the landscape, this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-5 (Alt. 4) **Potential to Result in More Frequent Collisions between Aircraft and Wildlife at Lake Tahoe Airport.** *Under Alternative 4, the golf course would remain in its current configuration, and the Upper Truckee River would be stabilized in place. Watershed improvement projects are considered compatible land uses under the CLUP. This impact would be* ***less than significant****.*

Under Alternative 4, the golf course would remain in its current configuration, and the Upper Truckee River would be stabilized in place. As described above, watershed improvement projects are considered compatible land uses under the CLUP. There would be no appreciable change in wildlife habitat quality or quantity, so the amount of wildlife in the study area that may be hazardous to aircraft would not increase. This impact would be less than significant.

No mitigation is required.

IMPACT 3.14-6 (Alt. 4) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation.** *Implementing Alternative 4 would increase the size of the floodplain by 0.4 acre relative to existing conditions. However, the new area of floodplain would not hold standing water. Therefore, implementing Alternative 4 would not result in greater potential for exposure of people to mosquito-borne viruses. This impact would be* ***less than significant****.*

Under Alternative 4, the active floodplain would not be directly modified except for a 500-foot section of inset floodplain excavation in the vicinity of the replacement bridge between holes 6 and 7. The inset floodplain would create approximately 0.4 acre of active floodplain. Due to this limited area additional ponding would not be expected and current mosquito abatement practices would continue. Therefore, implementing Alternative 4 would not increase mosquito abundance and the potential for exposure of people to mosquito-borne viruses. This impact would be less than significant.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.14-1 (Alt. 5) **Use of Hazardous Materials.** *Alternative 5 would involve the storage, use, and transport of hazardous materials to and within the study area during construction activities, golf operations, and ongoing fuels management. However, use of hazardous materials at the site would be in compliance with Federal, State, and local regulations. Therefore, impacts related to creation of significant hazards to the public through routine transport, storage, use, disposal, and risk of upset would not occur. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.14-1 (Alt. 2) because hazardous materials would be used for restoration purposes and on-going non-project related fuels management. However, the golf course would be decommissioned, and there would be no golf-related use of hazardous materials at the site after project construction. The maintenance yard would not be modified as part of Alternative 5; however, its use would be evaluated under a separate planning process and could be operated as a 9-hole course in the interim. Hazardous materials would continue to be stored at the maintenance yard in compliance with Federal, State, and local regulations, and the necessity of this facility would be evaluated at a later date. This impact would be less than significant.

IMPACT 3.14-2 (Alt. 5) **Potential Human Health Hazards from Exposure to Existing On-Site Hazardous Materials.** *Alternative 5 could expose workers to hazardous materials present on-site during construction activities and hazardous materials on-site could create an environmental or health hazard if left in place. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-2 (Alt. 2) because activities under Alternative 5 would involve construction and modifications to the river channel and floodplain surfaces. These activities would involve grading that could potentially expose unknown hazardous materials. However, Alternative 5 proposes to remove the golf course in its entirety and construction activities would not occur in the area of the former quarry on the Westside of the river. Any unknown hazardous materials associated with the former quarry would not be exposed or disturbed during construction under Alternative 5.

Mitigation Measure 3.14-2 (Alt. 5): **Implement Measures to Reduce the Risk of Health Hazards Associated with Potential Exposure to Hazardous Substances.**

This mitigation measure is identical to Mitigation Measure 3.14-2 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-2 (Alt. 5), Impact 3.14-2 (Alt. 5) would be less than significant.

IMPACT 3.14-3 (Alt. 5) **Potential for Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School.** *One school is located within one-quarter mile of the study area. Alternative 5 would involve the handling of hazardous materials or acutely hazardous materials in the study area during construction. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-3 (Alt. 2) because under Alternative 4 construction activities along the Upper Truckee River and floodplain would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School. However, golf course would be decommissioned and not relocated. Because construction activities would be within one-quarter mile of the Lake Tahoe Environmental Science Magnet School, this impact would be potentially significant.

Mitigation Measure 3.14-3 (Alt. 5): **Notify Applicable School District with Jurisdiction over Schools within One-Quarter Mile of Project Construction Activities.**

This mitigation measure is identical to Mitigation Measure 3.14-3 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-3 (Alt. 5), Impact 3.14-3 (Alt. 5) would be less than significant.

IMPACT 3.14-4 (Alt. 5) **Increased Exposure to Wildland Fire Hazard.** *Implementing Alternative 5 would decommission the Lake Tahoe Golf Course at Lake Valley SRA, including current irrigation practices. While the removal of the golf course would decrease the amount of human activity in the SRA, removal of irrigation during the fire season could potentially increase the risk for fire hazards. However, continuation of existing fire management practices would reduce this impact. This impact would be* ***less than significant****.*

Under Alternative 5 State Parks would be responsible for vegetation management in the Washoe Meadows SP and Lake Valley SRA. Implementing Alternative 5 would remove golf course landscape and replace it with native vegetation. Removal of the golf course would decrease the human activity in that area. Irrigation would be abandoned in place that could potentially increase the risk of fire hazards during the fire season when grasses are dryer; however, the Wildfire Management Plan that is currently being implemented would continue to be followed before, during, and after the proposed project is implemented. Because the Wildfire Management Plan includes methods of fire prevention and suppression this impact would be less than significant.

No mitigation is required.

IMPACT 3.14-5 (Alt. 5)	**Potential to Result in More Frequent Collisions between Aircraft and Wildlife at Lake Tahoe Airport.** *Under Alternative 5, portions of the Upper Truckee River watershed in Airport Safety Area 3 would be restored. The CLUP identifies watershed improvement projects as a compatible land use in Airport Safety Area 3. This impact would be* ***less than significant****.*

Under Alternative 5, areas of the Upper Truckee River and floodplain would be restored, and the golf course would be decommissioned. The CLUP identifies watershed improvement projects as a compatible land use in Airport Safety Area 3. The golf course is considered an attractant to wildlife that may be hazardous to aircraft, particularly waterfowl such as ducks and geese, in part because it is maintained and watered frequently. Decommissioning the golf course and restoring it as a meadow would improve the overall quality of the habitat, but not in a way that would attract an appreciable number of waterfowl beyond the existing numbers that are using the area. This impact would be less than significant.

No mitigation is required.

IMPACT 3.14-6 (Alt. 5)	**Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation.** *Implementing Alternative 5 would result in removal of the Lake Tahoe Golf Course, the associated irrigation practices and several untreated ponds. However, additional floodplain inundation and off-channel oxbows are a component of the project that could result in a greater abundance of mosquitoes and thus a greater potential for exposure of people to mosquito-borne viruses. This impact would be* ***potentially significant****.*

This impact is similar to Impact 3.14-6 (Alt. 2) because activities under Alternative 5 would involve construction and modifications to the river channel and floodplain surfaces. However, the golf course would be decommissioned and restored to floodplain and meadow, removing irrigation practices, increasing the area of active floodplain by 41 acres over existing conditions, as well as creating additional floodplain and meadow habitat throughout the current golf course area. The several existing water features on the course would be removed and replaced with meadow habitat. However, the use of the hole 9 irrigation pond would be evaluated in a future planning process. The existing water features, including the hole 9 pond are not treated by EDCVCD and could potentially increase risk associated with human health mosquito hazards. Furthermore, as described under Impact 3.14-6 (Alt. 2), increasing the size of the floodplain and creating off-channel oxbow features would increase the extent of calm, standing water in dense vegetation following flood events and thus increase or enhance breeding habitat for mosquitoes. Although reducing the area of untreated standing water and removing irrigation within the SRA under Alternative 5 would reduce the abundance of mosquitoes in this area, the floodplain and meadow area would be increased, which could result in an increase in the abundance of mosquitoes and thus increase the potential for exposure of people to mosquito-borne viruses. Therefore, implementing Alternative 5 could potentially increase mosquito abundance and the potential for exposure of people to mosquito-borne viruses. This impact would be potentially significant.

Mitigation Measure 3.14-6 (Alt. 5): Establish and Implement a Management Agreement with the El Dorado County Vector Control District.

This mitigation measure is identical to Mitigation Measure 3.14-6 (Alt. 2). For the same reasons as described under Alternative 2, with implementation of Mitigation Measure 3.14-6 (Alt. 5), Impact 3.14-6 (Alt. 5) would be less than significant.

3.15 POPULATION AND HOUSING, SOCIOECONOMICS, AND ENVIRONMENTAL JUSTICE

The study area is in unincorporated territory of El Dorado County, California, adjacent to the community of Meyers and south of the City of South Lake Tahoe. Socioeconomic data are not segregated to provide discreet information about the Meyers community. The City of South Lake Tahoe is within the area influenced by economic activity within the study area (i.e., existing golf course), so its socioeconomic data is also relevant. Information related to both the county as a whole and to the nearby City of South Lake Tahoe is provided to present the socioeconomic conditions of the community around the study area. This section describes the demographic and socioeconomic characteristics of South Lake Tahoe and El Dorado County. It analyzes the possible changes in population, housing, and employment that could result from implementation of the Upper Truckee River Restoration and Golf Course Reconfiguration Project, including those that could trigger adverse physical effects in the city or the region. This section also addresses environmental justice issues associated with the project's implementation.

Analysis of the economic impacts of the project on the Lake Tahoe Golf Course is based on the study conducted by Hansford Economic Consulting (HEC 2008 [Appendix E]). The project's impacts on the Lake Tahoe Golf Course related to recreation are addressed in Section 3.13, "Recreation." Project impacts on Indian tribes are addressed in Section 3.9, "Cultural Resources." Cumulative effects to population and housing, socioeconomics, and environmental justice are presented in Section 3.16, "Cumulative Impacts."

3.15.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

Socioeconomics

NEPA, Section 1502

NEPA provisions found in Section 1502.16(c) of the Code of Federal Regulations (40 CFR 1502.16[c]) requires Federal agencies to identify potential conflicts between a proposed action and the related plans and policies of Federal, State, and local agencies and Indian tribes. This requirement helps Federal agencies identify potential conflicts that may cause adverse effects on the social and economic environment of a study area, because many agencies' and tribes' plans and policies are designed to protect the people residing within their jurisdictions and/or the local economy they depend upon for their economic livelihoods (NEPAnet 2008).

Council on Environmental Quality

The Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508) provide guidance related to social and economic impact assessments. These regulations note that the "human environment" assessed under NEPA is to be "interpreted comprehensively" to include "the natural and physical environment and the relationship of people with that environment" (40 CFR 1508.14). Furthermore, these regulations require agencies to assess "aesthetic, historic, cultural, economic, social, or health" effects, whether direct, indirect, or cumulative (40 CFR 1508.8). Some Federal agencies, including the U.S. Bureau of Land Management and USFS, have developed socioeconomics-related handbooks and instructional memoranda to help the preparers of environmental impact statements comply with NEPA with respect to socioeconomic resources.

Environmental Justice

In 1994, President Bill Clinton issued Executive Order 12898 regarding environmental justice. This order requires Federal agencies to “identify and address” disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. Two documents provide some measure of guidance to agencies required to implement this executive order: *Environmental Justice Guidance under the National Environmental Policy Act* (CEQ 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA’s NEPA Compliance Analysis* (EPA 1998). Both serve as a guide for incorporating environmental justice goals into preparation of environmental impact statements under NEPA. These documents provide specific guidelines for determining whether any environmental justice issues are associated with a proposed Federal project.

State

Cal/EPA adopted an environmental justice policy in 2004 (Cal/EPA 2004). Pursuant to Sections 71110–71113 of the California Public Resources Code, Cal/EPA developed this policy to provide guidance to its resource boards, departments, and offices. The policy is intended to support the State’s goal of “achieving fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies.” While the Cal/EPA policy is not directly applicable to State Parks, it provides a context for the state’s position on environmental justice.

Tahoe Regional Planning Agency

TRPA recognizes a relationship between the health of the natural environment and the social and economic health of the region. The following declaration from the TRPA Compact (1980) states:

> **Article 1, Finding 6:** Maintenance of the social and economic health of the region depends on maintaining the significant scenic, recreational, educational, scientific, natural public health values provided by the Lake Tahoe Basin.

1987 Regional Plan/Pathway

TRPA regulates growth and development in the Lake Tahoe region through the Regional Plan. TRPA’s Regional Plan, adopted in 1987, consists of several documents: Goals and Policies, Code of Ordinances, Water Quality Management Plan, Plan Area Statements, and Scenic Quality Improvement Plan.

The 1987 Regional Plan had a 20-year scope and is currently being reviewed and updated through a collaborative effort led by TRPA. These agencies are working together to update several important environmental documents for the Tahoe Basin. These Regional Plan updates will guide land management, resource management, and environmental regulations in the Tahoe Basin over the next 20 years. The Regional Plan update is anticipated to be completed by 2011.

Regional Plan Goals and Policies

The following policy regarding socioeconomics from TRPA’s Regional Plan (TRPA 2004), listed under Goal 1 of the Land Use Element, is applicable to the project:

- **Policy 3:** The Regional Plan shall seek to maintain a balance between economic health and the environment.

TRPA Environmental Threshold Carrying Capacities

TRPA does not have any established thresholds related to socioeconomics, population and housing, or environmental justice.

ENVIRONMENTAL SETTING

Population

The City of South Lake Tahoe experienced its most dramatic population growth between 1970 and 1980, when its population grew from 12,921 to 20,681, or 4.82 percent per year. From 1990 to 2000, the population increased from 21,586 to 23,609, or 0.94 percent per year (City of South Lake Tahoe 2008a:3-2). The city's year-round population reached a peak in 2002 and declined slightly between 2002 and 2006, mainly as a result of regulations that limited the number of new residential units. As of January 1, 2008, the California Department of Finance estimated that South Lake Tahoe's population was approximately 23,725 persons (DOF 2008a).

Approximately 15 percent of El Dorado County's population lives in South Lake Tahoe. The remaining population of the county resides in the incorporated city of Placerville (10,237 residents, or 6 percent of the county's population) and unincorporated areas, including El Dorado Hills, Cameron Park, Shingle Springs, Meyers, and Pollock Pines (DOF 2008a).

El Dorado County has experienced a higher rate of population growth than South Lake Tahoe. Although the city's population increased approximately 4.82 percent per year from 1970 to 1980, the county's population increased approximately 6.95 percent per year during the same period (City of Lake Tahoe 2008a:3-3). From 1990 to 2000, the population of El Dorado County increased from 125,955 to 156,299, for an average growth rate of 2.18 percent per year. As of January 2008, the California Department of Finance estimated that the county's population was 179,722 persons (DOF 2008a).

Housing

The number of housing units in South Lake Tahoe decreased from 14,066 in 1990 to 14,005 in 2000, a decrease of less than 0.01 percent (City of South Lake Tahoe 2008b:4-17). Although the housing statistics do not show a net increase in housing units, the city has seen an increase in residential development in recent years. Some of this housing development has occurred in places where existing units were demolished or rehabilitated; thus they are not reflected in the net housing growth (City of South Lake Tahoe 2008b:4-18). The number of housing units, as of January 1, 2008, was estimated to be 14,355 (DOF 2008b). Median home prices in South Lake Tahoe declined by 6.2 percent during a 1-year period (November 2006 to November 2007), from $453,000 to $425,000 (City of South Lake Tahoe 2008b:4-52).

The residential areas to the east, west, and south of the study area are known as Country Club Estates. Although median home prices are declining in South Lake Tahoe as a whole, the median housing prices in Country Club Estates are increasing. In 2007, the median sale price of residences in Country Club Estates was $565,000. As of August 2008, the median sale price was $682,500 (Lake Tahoe Real Estate 2008).

Vacancy Rates

Vacancy trends in housing are analyzed using vacancy rates to establish the relationship between housing supply and demand. If the demand for housing units is greater than the available supply, then the vacancy rate is low and the price of housing will most likely increase. According to the California Department of Housing and Community Development, a housing vacancy rate of 5 percent is considered normal (HCD 2000). Vacancy rates below 5 percent indicate a housing shortage in a community. The city had a vacancy rate of 2.0 percent for owner-occupied units and 8.3 percent for rental units in 2000 (City of South Lake Tahoe 2008b:4-28). Of the 14,005 housing units in the city in 2000, 4,595 housing units (32.8 percent) were reported to be vacant at the time of the U.S. Census (Table 3.15-1).

Table 3.15-1 Vacancy Status of Housing Units in South Lake Tahoe		
Vacancy Status	Total Units	Percent (%)
For rent only	482	3.4
For sale only	84	0.6
Rented or sold (not occupied)	97	0.7
Migrant workers	1	0.0
For seasonal, recreational, or occasional use	3,677	26.3
Other vacant	254	1.8
Total	**4,595**	**32.8**
Source: City of South Lake Tahoe 2008a:3-12		

Second-Home Ownership

Second-home ownership has several implications for land use planning because varied economic expectations for property ownership, community development, and reinvestment result. As in any tourist destination, a large portion of the housing units in the city are seasonally occupied second homes. Because the U.S. Census is collected in April during the city's low tourist season, most of these units are measured as vacant. The majority of vacant units (26.3 percent of the total housing stock) were for seasonal, recreational, or occasional use (Table 3.15-1). Based on transient occupancy taxes, approximately 1,290 housing units were used as vacation rentals at any one time (City of South Lake Tahoe 2008a:3-11). The majority of vacation rentals are larger second homes in prestigious areas of the city. The second-home market in South Lake Tahoe increases competition for home buyers, which results in increasing housing prices (City of South Lake Tahoe 2008b:4-29).

Socioeconomics

The Lake Tahoe region, including South Lake Tahoe, has a primarily tourist-based economy. Unlike other areas in the Sierra Nevada, South Lake Tahoe derives little industrial growth from population growth or increased affluence of local residents (City of South Lake Tahoe 2008b:3-18). The impact of visitors on the economy in the Lake Tahoe region was studied in the *2001 Threshold Evaluation* (TRPA 2002). Estimates generated by the report indicated that in 2000, visitors to the region spent more than $1.5 billion on travel-related goods and services. Businesses that depend primarily on travel and tourism, such as lodging establishments, gaming, restaurants, and recreation services, provide a major source of employment and payroll in the Lake Tahoe region. However, since the 2001 study given the current state of the economy, the Lake Tahoe region has experienced a decline in visitor spending. According to the U.S. Travel Association, travel spending is down 12 percent through June of this year (Modesto *Bee* 2009). The hotel occupancy rate in the South Lake Tahoe region was 47.1 percent in June, down nearly 13 percent from June 2008.

Employment

Table 3.15-2 shows the total number of people employed by major industries who resided in South Lake Tahoe in 2005. Employed citizens totaled 14,559. Of these, approximately 8,089 (55.6 percent) worked in the services industry, including 3,889 hotel and lodging workers, 648 entertainment and recreation workers, and 1,221 health and medical services workers. Retail trade was the second largest industry, with 3,833 workers (26.3 percent), including 1,139 restaurant employees. Many companies in the service industry and retail trade employ a seasonal workforce that is often composed of younger or college-aged workers. After Labor Day and in spring, hours of employment for seasonal employees tend to decrease, and in some cases, full-season layoffs occur (City of South Lake Tahoe 2008b:4-24).

Table 3.15-2 2005 Employment by Major Industry		
Industry	Total Employees	Percentage (%)
Agricultural, Forestry, Fishing	190	1.3
Mining	3	0.0
Construction	306	2.1
Manufacturing	60	0.4
Transportation and Communications	475	3.3
Wholesale Trade	171	1.2
Retail Trade	3,833	26.3
Finance, Insurance, and Real Estate	692	4.8
Services	8,089	55.6
Public Administration	740	5.1
Total	**14,559**	**100**
Source: City of South Lake Tahoe 2008b:4-25		

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. “Fair treatment” means that no group of people (defined by race, national origin, or income) should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. “Meaningful involvement” means that (1) people have an opportunity to participate in decisions about activities that may affect their environment and/or health; (2) the public’s contribution can influence the regulatory agency’s decision; (3) their concerns will be considered in the decision-making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected (EPA 2009).

Racial Distribution

Table 3.15-3 shows the racial composition of the populations of South Lake Tahoe and El Dorado County. The city’s population is shown to be predominantly white, accounting for 85.7 percent of the population in 1990 and 75.7 percent in 2000. However, the city has a proportionally smaller white population than the county. El Dorado County’s white population accounted for 94.5 percent of the total population in 1990, and 89.7 percent in 2000. The white population increased in both the county and city between 1990 and 2000; however, South Lake Tahoe’s white population decreased by 3.3 percent during the same period.

The Black/African American population in South Lake Tahoe decreased 20.2 percent between 1990 and 2000. El Dorado County had a larger proportion of Black/African American residents than South Lake Tahoe, and the Black/African American population increased by 34.2 percent during the same period.

For both the city and county, the American Indian/Alaskan Native population generally remained the same between 1990 and 2000, comprising 1 percent of the total population in each location.

The Asian population in South Lake Tahoe increased by 3.8 percent between 1990 and 2000, accounting for 6 percent of the population in 2000. In comparison, El Dorado County’s Asian population increased by 35.5 percent between 1990 and 2000.

South Lake Tahoe's Hispanic/Latino population grew significantly between 1990 and 2000, increasing by 57.2 percent and accounting for more than a quarter of the city's total population in 2000. Between 1990 and 2000, El Dorado County also experienced significant growth in the number of its Hispanic/Latino residents, an increase of 66 percent.

Table 3.15-4 shows the 2007 racial composition of the population in South Lake Tahoe. South Lake Tahoe's population remains predominantly white and generally remained the same between 2000 and 2007. The remaining race/ethnic categories increased between 2000 and 2007. The largest increase during this period was the Hispanic/Latino population, which increased 30.9 percent, followed by the Asian population, which increased 11.0 percent. The Black/African American and American Indian/Alaskan Native populations increased 1.2 percent and 1.3 percent, respectively, during the same period.

Table 3.15-3
Population Distribution by Race and Ethnicity for the City of South Lake Tahoe and El Dorado County

Race/Ethnicity [1]	1990		2000		Percent of Change
	Population	Percent of Total	Population	Percent of Total	
City of South Lake Tahoe					
White	18,496	85.7	17,878	75.7	-3.3
Black or African American	223	1.0	178	0.8	-20.2
American Indian or Alaskan Native	226	1.0	228	1.0	0.9
Asian	1,367	6.3	1,419	6.0	3.8
Hispanic or Latino [2]	4,003	18.5	6,294	26.7	57.2
Total Population	**21,586**	**100**	**23,609**	**100**	**9.4**
El Dorado County					
White	119,118	94.5	140,209	89.7	17.7
Black or African American	606	0.5	813	0.5	34.2
American Indian or Alaskan Native	1,351	1.1	1,566	1.0	15.9
Asian	2,456	1.9	3,328	2.1	35.5
Hispanic or Latino [2]	8,777	7.0	14,566	9.3	66.0
Total Population	**125,995**	**100**	**156,299**	**100**	**24.1**

Notes:

[1] The "other" and "two or more races" categories are not included in the table because of changes in descriptive measures between the 1990 and 2000 U.S. Census.

[2] The U.S. Census Bureau considers Hispanic and Latino as an ethnicity, not a race. Consequently, a person of Hispanic or Latino descent could identify racially as White, Black/African American, Native American, Asian, or other.

Sources: U.S. Census Bureau 2000, City of South Lake Tahoe 2008a:3-8

Table 3.15-4
2007 Population Distribution by Race and Ethnicity for the City of South Lake Tahoe

Race/Ethnicity [1]	Population	Percent Increase
White	20,136	75.9
Black or African American	319	1.2
American Indian or Alaskan Native	356	1.3
Asian	2,927	11.0
Hispanic or Latino [2]	8,208	30.9

Notes:

[1] The "other" and "two or more races" categories are not included in the table because of changes in descriptive measures between the 1990 and 2000 U.S. Census.

[2] The U.S. Census Bureau considers Hispanic and Latino as an ethnicity, not a race. Consequently, a person of Hispanic or Latino descent could identify racially as White, Black/African American, Native American, Asian, or other.

Source: City of South Lake Tahoe 2008a:3-8

Poverty Status

Table 3.15-5 shows the 1999 median household income, per capita income, and the percent of persons below poverty level in South Lake Tahoe and El Dorado County. The city's median household income was lower than that of the county. The city's median income was $34,707, and its per capita income was $18,452, compared to a median income of $51,484 and a per capita income of $25,560 in the county. Approximately 12.5 percent of city residents were below poverty level, while 7.1 percent of county residents were below poverty level. This difference can be accounted for in part by South Lake Tahoe's relatively high cost of living. In addition, people employed in the seasonal service industry and retail workforce generally worked in lower wage jobs.

Table 3.15-5
Per Capita Income and Poverty Level

Community	Median Income	Per Capita Income[1]	Percent of Persons Below Poverty Level
South Lake Tahoe	$34,707	$18,452	12.5
El Dorado County	$51,484	$25,560	7.1

[1] Per capita income is the mean income computed for every man, woman, and child residing in South Lake Tahoe and El Dorado County, respectively.

Sources: U.S. Census Bureau 2000, City of Lake Tahoe 2008a:3-13, 3-16

Economic Activity of the Lake Tahoe Golf Course

Since 1989, the Lake Tahoe Golf Course has been operated by American Golf Corporation under a concessionaire contract with State Parks. Approximately $881,000 in concession revenue generated by operations of the Lake Tahoe Golf Course is allocated to State Parks (data based on average of years 2003-2006) (HEC 2008:5 [Appendix E]) annually. This represents the fifth largest source of concession revenue in the State Parks system (HEC 2008:11 [Appendix E]).

The 18-hole regulation golf course generally operates from April 15 through November 1, weather permitting, with 80 percent of annual gross revenues generated from June through September. Winter recreational activities, including snowmobiling and cross-country skiing, may occur at the golf course from December through March, snow permitting. The clubhouse, which includes food and beverage service and event facilities, operates year round. However, the clubhouse is open only for events during winter. The Lake Tahoe Golf Course averages 76 full- and part-time employees, the majority of whom are employed in food and beverage service jobs.

Golf Course Revenues

Revenues change from year to year, based mostly on variations in weather and corresponding annual changes in the number of rounds played. In addition, the Lake Tahoe Golf Course is particularly susceptible to changes in annual revenue per round because of its reliance on visitor golfers.

Table 3.15-6 shows average revenues for 2003–2006, shown in 2007 dollars, adjusted for inflation. As shown, average revenues for the Lake Tahoe Golf Course totaled $2,012,000 for golf activities, $780,000 for concessions and other activities, and $17,000 for snowmobile sublease payments, for a total of $2,809,000. Seventy-two percent of total annual revenues are generated by golf activities, 28 percent by concessions and other activities (which include merchandise and food and beverage sales associated with golf-related activities), and 1 percent by snowmobile sublease payments. Total revenues are approximately $85 per round of golf (with golf operations–only revenues $61 per round) (HEC 2008:22 [Appendix E]).

Table 3.15-6 2003–2006 Revenues for the Lake Tahoe Golf Course All Figures in 2007 Dollars[1]						
Revenues	2003	2004	2005	2006	2003–2006 Average	Percent of Revenue [2]
Golf concessionaire operations [3]	$2,237,935	$2,136,080	$1,837,258	$1,842,612	$2,012,000	72
Concessions [4]	$84,6173	$764,292	$789,686	$730,997	$780,000	28
Snowmobile sublease payments	N/A	$19,748	$22,561	$9,295	$17,000	1
Total Annual Revenue	**$3,084,108**	**$2,920,120**	**$2,649,506**	**$2,582,905**	**$2,809,000**	**100**

Notes:
1 Data for the 2003 through 2006 time period is shown in 2007 dollars to adjust for inflation.
2 The percent of revenue does not add to 100% because of rounding.
3 Golf concessionaire operations include green fees, cart rental, and driving range fees.
4 Concessions include merchandise, food, beverage, service charges, and other fees.
Source: HEC 2008:22 (Appendix E)

Golf Course Expenditures

Table 3.15-7 shows average expenditures for 2003–2006, including payments to State Parks. Average expenditures totaled $233,000 for the cost of goods, $628,000 for payroll, $286,000 for operating expenses, $89,000 for leases and replacement of equipment, and $79,000 for taxes and insurance. The greatest share of expenditures is payroll, at 48 percent of total average annual expenditures. Estimated revenues determine payments to State Parks. Rent to State parks and contributions to the Capital Improvement Project (CIP) fund are deducted from net revenues to estimate net annual concessionaire revenues (HEC 2008:58 [Appendix E]).

Table 3.15-7 2003–2006 Expenditures for the Lake Tahoe Golf Course All Figures in 2007 Dollars[1]						
Expenditure Category	Expenditures (dollars)					Percent of Expenses [2]
	2003	2004	2005	2006	2003–2006 Average	
Goods [2]	$280,917	$226,605	$214,872	$210,860	$233,000	18
Payroll [3]	$672,684	$652,961	$615,374	$571,205	$628,000	48
Operating expenses [4]	$263,882	$280,529	$308,456	$292,360	$286,000	22
Leases, rentals, and equipment replacement	$103,508	$82,740	$80,086	$89,880	$89,000	6
Taxes and Insurance	$83,345	$76,640	$70,921	$85,840	$79,000	6
Total Annual Expenses	**$1,404,337**	**$1,319,476**	**$1,289,709**	**$1,250,143**	**$1,316,000**	**100**
Total Payments to State Parks[5]	**$1,051,798**	**$922,559**	**$795,635**	**$779,364**	**$887,339**	**--**

Notes:
1 Data for the 2003 through 2006 time period are shown in 2007 dollars to adjust for inflation.
2 The percent of revenue does not add to 100% because of rounding.
3 Goods include merchandise, food, and beverages.
4 Operating expenses include utilities, carts, course maintenance, food, and beverages.
5 Total payments to State Parks include CIP Fund and rent to State Parks.
Source: HEC 2008:25 (Appendix E)

Golf Course Influence on the South Lake Tahoe Area Economy

Operation of the Lake Tahoe Golf Course results in direct spending in South Lake Tahoe and the surrounding South Shore area. Revenues attributed to visitors to the Lake Tahoe Golf Course include spending on lodging, retail sales, other recreation, and food and beverages; generation of tax revenues; and employee earnings from jobs at the golf course and elsewhere in South Lake Tahoe and the surrounding area (Table 3.15-8).

Estimated tax revenues generated by the Lake Tahoe Golf Course include sales tax on merchandise and food and beverages, as well as property tax. Sales tax charged for food and beverages and for all merchandise sales generate $53,000. Property taxes are paid by the concessionaire for possessory interest of the property, and annual property tax payments to South Lake Tahoe total $65,000. In total, the Lake Tahoe Golf Course generates $118,000 in sales and property taxes (HEC 2008:65 [Appendix E]).

In addition to tax revenues generated by economic activity at the Lake Tahoe Golf Course, visitors to the golf course generate tax revenues elsewhere in South Lake Tahoe and the surrounding area. Additional tax revenues include $157,000 in transient occupancy taxes, $115,000 in sales taxes from retail sales, and $103,000 in sales taxes from food and beverages. These tax revenues total $375,000 (HEC 2008:65 [Appendix E]).

Based on spending in the South Lake Tahoe area by visitors to the Lake Tahoe Golf Course, golfers are estimated to generate 168 full- and part-time jobs associated with employment to service visitor needs. Of these jobs, 76 are at the Lake Tahoe Golf Course and 92 are elsewhere in the South Lake Tahoe area. Direct earnings attributed to these jobs total $2,666,133 (HEC 2008:65 [Appendix E]).

Table 3.15-8
Revenues in the South Lake Tahoe Area Generated by Visitors to the Lake Tahoe Golf Course

Category	Revenue (dollars)
Visitor Spending in South Lake Tahoe and Surrounding Areas	
Lodging	$1,569,960
Other recreation	$783,440
Retail sales	$1,644,720
Food and beverage	$1,569,960
Employee Earnings	
Lake Tahoe Golf Course [1]	$628,000
City of Lake Tahoe	$2,038,133
Tax Revenues	
Lake Tahoe Golf Course [2]	$118,000
City of South Lake Tahoe and surrounding areas [3]	$375,000
Total for All Categories	$8,727,213

Notes:
[1] It is assumed that earnings by employees at the Lake Tahoe Golf Course would be spent in South Lake Tahoe and the surrounding area.
[2] Tax Revenues generated by the Lake Tahoe Golf Course include sales tax and property tax paid to the City of South Lake Tahoe.
[3] Tax Revenues include transient occupancy tax and sales tax.
Source: HEC 2008:61, 62 (Appendix E)

Socioeconomic Characteristics of Golfers

The total number of golfers is affected by ethnicity, population growth, income, and age of players. In general, Caucasians have a higher participation rate, while the participation rates of Hispanic and African-American populations are lower (HEC 2008:27 [Appendix E]). Approximately two-thirds of rounds played are estimated to be made by visitors to the Tahoe Basin. Based on a survey conducted by State Parks in 2007, the primary reasons golfers chose the Lake Tahoe Golf Course are convenience of location and playing an 18-hole regulation course. In addition, 63 percent of golfers chose the Lake Tahoe Golf Course for its scenic beauty, followed by difficulty (48 percent) and price (37 percent) (HEC 2008:29-30 [Appendix E]).

Because the majority of players are non-local, it is unsurprising that just over half of all players make less than 5 visits per year. Approximately 30 percent play more than 16 times per year. If the players frequenting the course more than 16 times per year represent the local player population, then over the course of the summer the locals play golf more than 3 times per month (HEC 2008:29 [Appendix E]). Although the local population only plays about one-third of the golf rounds at the Lake Tahoe Golf Course, they may be described as “avid” or “core” golfers and are important contributors to early- and late-season spending there (HEC 2008:8 [Appendix E]).

Personal income is a major determinant of rounds played at Lake Tahoe Golf Course because the majority of players are visitors, whose total trip costs are largely spent on transportation. The increase in the retirement-age population is projected to increase the rounds played nationally in the near future, but it is not necessarily applicable to the Lake Tahoe Golf Course because retired persons tend to have more fixed incomes (HEC 2008:9 [Appendix E]).

3.15.2 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual information; scientific data; and regulatory standards of Federal, State, and local agencies.

NEPA, the State CEQA Guidelines, and TRPA’s Initial Environmental Checklist exclude discussion of significance criteria for economic impacts, which in themselves are not considered effects on the environment (although CEQA recognizes that a secondary physical effect can conceivably occur in response to an economic impact). Thus, no significance criteria have been established. For the purposes of this analysis, the standard environmental impact conclusion statements of “less than significant” and “significant” are not used. Instead, when addressing economic impacts, this analysis uses the following terminology: “no impact,” “beneficial effect,” and “adverse impact.” Additionally, mitigation measures for any adverse economic impacts are not identified.

CEQA Criteria

Although the State CEQA Guidelines exclude discussion of significance criteria for economic impacts, the guidelines include questions related to population growth and displacement. Based on Appendix G of the State CEQA Guidelines, a population or housing impact is considered significant if implementation of the project would do any of the following:

- induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or

- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

Executive Order 12898 of February 11, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), requires that "each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health effects of its programs, policies, and activities on minority populations and low-income populations.…" U.S. Council on Environmental Quality (CEQ) guidance also requires the evaluation of a project's socioeconomic effects on low-income and minority communities. According to CEQ, a minority is a member of any of the following groups: Black/African American; Hispanic, regardless of race; Asian; Native Hawaiian or Other Pacific Islander; and American Indian or Alaska Native.

In a memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President states that "each federal agency shall analyze the environmental effects on minority communities and low-income communities, when such analysis is required by NEPA."

NEPA provides no specific thresholds of significance for socioeconomic impact assessment. Significance varies, depending on the setting of the proposed action (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth inducing and others related to induced changes in the pattern of land use, population density, or growth rate.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on population and housing if it would:

- alter the location, distribution, density, or growth rate of the human population planned for the region;
- include or result in the temporary or permanent displacement of residents;
- affect existing housing, or create a demand for additional housing by:
  - decreasing the amount of housing in the Tahoe Region or
  - decreasing the amount of housing in the Tahoe Region historically or currently being rented at rates affordable by lower and very-low-income households; or
- result in the loss of housing for lower income and very-low-income households.

METHODS AND ASSUMPTIONS

State Parks commissioned the Lake Tahoe Golf Course Economic Feasibility Analysis (Appendix E) for the Lake Tahoe Golf Course and surrounding golf courses to assist in evaluation of the economic and socioeconomic effects of the proposed project. One of the purposes of the economic analysis was to study the feasibility of continued operations at Lake Valley SRA both with and without a golf course, in light of the objectives of the alternatives. The analysis examines three scenarios for configuring the golf course:

- an 18-hole regulation golf facility (with two suboptions, one of which includes potential changes to course layout);
- a reduced-play area (nontraditional length such as 9 hole or executive) course with all golf activities located on the east side of the river (this scenario is modeled with a range of potential green fees resulting in a low to high range of financial projections); and
- no golf course, but retention of the clubhouse for an events facility.

This analysis addresses the revenue and operating expenditures of each scenario, as well as the changes in revenues to be received by State Parks, changes in revenues received by the concessionaire, and economic impacts within the surrounding community (which, for purposes of this draft EIR/EIS/EIS, is the south shore portion of the Lake Tahoe Basin). It should be noted that the "base case scenario" or existing condition for the purposes of the economic and fiscal analysis is based on data averaged from years 2003-2006. The economic and fiscal analysis of the alternatives presented below relies on the Lake Tahoe Golf Course Economic Feasibility Analysis.

Potential growth inducement impacts of the alternatives are addressed in Section 4.4, "Growth-Inducing Impacts."

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT AND NOT DISCUSSED FURTHER

Displacement of housing or people – No alternative would involve actions that would displace people or housing or otherwise alter the location, distribution, or density of the planned human population.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: No Project/No Action—Existing River and 18-Hole Regulation Golf Course

IMPACT 3.15-1 (Alt. 1)	Population, Employment, and Housing. *Alternative 1 would not involve any changes to the Lake Valley SRA, Lake Tahoe Golf Course, or Washoe Meadows SP. Impacts on population, employment, and housing would not occur.* ***No impact*** *would occur.*

Alternative 1 does not involve any changes to the Lake Valley SRA, the facilities of and uses at the Lake Tahoe Golf Course, or Washoe Meadows SP. No construction would occur, and all existing recreational facilities would remain unchanged. The number of jobs and employee earnings would also remain unchanged. Housing would not be affected because there would be no new population or demand generated by implementing Alternative 1. Therefore, impacts related to population, employment, and housing would not occur.

No mitigation is required.

IMPACT 3.15-2 (Alt. 1)	Economic Impact on the Community. *Alternative 1 would not involve any changes to the Lake Tahoe Golf Course. Economic impacts on the community would not occur.* ***No impact*** *would occur.*

Operation of the Lake Tahoe Golf Course results in direct spending in South Lake Tahoe and the surrounding South Shore area. Revenues attributed to visitors to the Lake Tahoe Golf Course include spending on lodging, retail sales, other recreation, and food and beverages; generation of tax revenues; and employee earnings from jobs at the golf course and elsewhere in South Lake Tahoe and the surrounding area (Table 3.15-8). Under current conditions, total revenue to the local economy, including visitor spending, employee earnings, and tax revenue, is estimated at $8.7 million annually. Under Alternative 1, no changes would occur to the golf course; therefore, revenues would remain unchanged. No economic impact would occur to the community with implementation of Alternative 1.

No mitigation is required.

IMPACT 3.15-3 (Alt. 1) **Environmental Justice.** *Alternative 1 would not involve any changes to the Lake Tahoe Golf Course. Impacts on minority or low-income populations would not occur.* ***No impact*** *would occur.*

Executive Order 12898 was drafted in response to a recurring circumstance whereby locally undesirable land uses were being sited in proximity to minority and low-income populations, which, in turn, were often underrepresented in political decision-making processes. As shown in Table 3.15-3, South Lake Tahoe's population is predominantly white, accounting for 75.7 percent of the population. The next largest ethnic group is the Hispanic or Latino population at 26.7 percent, with Asians as the third largest at 6 percent. Combined, Black/African American and American Indian/Alaskan Native compose less than 2 percent of the total population in South Lake Tahoe. Approximately 12.5 percent of South Lake Tahoe residents were below poverty level, whereas 7.1 percent of county residents were below poverty level (Table 3.15-5). This difference can be accounted for in part by South Lake Tahoe's relatively high cost of living. In addition, people employed in the seasonal service industry and retail workforce generally worked in lower wage jobs (City of South Lake Tahoe 2008a:3-13, 3-16).

Under Alternative 1, current uses at the Lake Tahoe Golf Course would continue. There would be no identifiable impacts on minority or low-income populations who live within the South Lake Tahoe area as a result of continued operations of the golf course. Current uses at the Lake Tahoe Golf Course do not represent a disproportionate effect on low-income or minority populations; therefore, there would be no significant impacts related to environmental justice.

No mitigation is required.

IMPACT 3.15-4 (Alt. 1) **Fiscal Impact on State Parks.** *Alternative 1 would not involve any changes to the Lake Tahoe Golf Course. There would be no changes to State Parks revenues.* ***No impact*** *would occur.*

Since 1989, the Lake Tahoe Golf Course has been operated by American Golf under a concessionaire contract with State Parks. Approximately $881,000 in concession revenue generated by operations of the Lake Tahoe Golf Course is allocated to State Parks annually (HEC 2008:5 [Appendix E]). This amount represents the fifth largest source of concession revenue in the State Parks system (HEC 2008:11 [Appendix E]).

Under Alternative 1, no changes would occur to the golf course; therefore, revenues to State Parks would remain unchanged. No fiscal impacts to State Parks would occur.

No mitigation is required.

Alternative 2: River Ecosystem Restoration with Reconfigured 18-Hole Regulation Golf Course

IMPACT 3.14-1 (Alt. 2) **Population, Employment, and Housing.** *Implementing Alternative 2 would result in short-term and long-term changes in population, employment, and housing. This impact would be* ***less than significant****.*

Alternative 2 does not include the development of residential uses; therefore, there would be no direct contribution to local or regional growth in population or housing. Employment growth associated with Alternative 2 could result in indirect housing demand and population growth through project-induced in-migration to the region. The projected number of employees is based on rounds per employee for golf-activity employees, number of major pieces of equipment per employee for golf course maintenance employees, and number of events per employee for food and beverage employees (HEC 2008:45 [Appendix E]). After it is constructed, Alternative 2 would result in the need for four additional employees at the Lake Tahoe Golf Course, increasing from the current 76 to 80 employees (total employment, including other areas of the study area, would be 172). This increase would represent a very small amount (less than 1 percent) of the services industry employment within the South Lake Tahoe area (Table 3.15-2). This increase in employment associated with operation of Alternative 2, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand.

Construction of Alternative 2 would involve a short-term increase in population and employment and potentially would create a short-term need for additional housing because of the need to hire and house construction workers. Construction of Alternative 2 is scheduled to take place over a 3- to 4-year period. Construction year 3 would involve the highest number of workers at one time, involving up to 58 construction workers during the peak construction period (May through October) (Table 2-4).

It is expected that the created construction jobs would be drawn from a regional labor pool and would not be exclusive to the South Lake Tahoe area. Some of the workers would commute in, while others may require short-term housing. According to the California Department of Housing and Community Development, a housing vacancy rate of 5 percent is considered normal (HCD 2000). Vacancy rates below 5 percent indicate a housing shortage in a community. The City of South Lake Tahoe had a vacancy rate of 8.3 percent for rental units in 2000 (City of South Lake Tahoe 2008b:4-28). The addition of 58 seasonal construction workers to the South Lake Tahoe area would not be great enough in magnitude to substantially affect rental housing demand even if all 58 required rental housing. Construction employment in the South Lake Tahoe area constitutes approximately 2 percent of total employment. The increase in employment associated with construction, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand.

Therefore, implementing Alternative 2 is not expected to result in significant impacts on population, employment, or housing on either a localized or a regional basis. The impact would be less than significant.

No mitigation is required.

IMPACT 3.15-2 (Alt. 2) **Economic Impact on the Community.** *Alternative 2 would involve improvements to the Lake Tahoe Golf Course that would alter tax revenues, jobs, and earnings associated with the golf course. This effect would be* ***beneficial****.*

According to the Lake Tahoe Golf Course Economic Feasibility Analysis, reconfiguration of the Lake Tahoe Golf Course under Alternative 2 would not affect total visitor spending or the total number of jobs in the South Lake Tahoe area (outside Lake Tahoe Golf Course) compared to existing conditions. The total number of Lake Tahoe Golf Course–generated visitors is currently 8,942, with total annual spending estimated at $7,476,000Under Alternative 2, it is estimated that the number of Lake Tahoe Golf Course–generated visitors and spending would remain the same since it is assumed that a well-designed, reconfigured 18-hole regulation course that takes maximum advantage of the terrain and vistas would have a financial performance similar to that currently experienced at Lake Tahoe Golf Course. Total Lake Tahoe Golf Course revenues, including golf activities and concessions/other is currently $2,789,000. Total revenue is projected to slightly increase by $20,000 to $2,809,000 due to increased spending on golf-related food, beverage and events (HEC 2008: Table 22 [Appendix E]).Alternative 2 is estimated to increase revenue generated by sales tax by $2,000. Annual total tax revenue generated from both sales and property tax would therefore increase from $118,000 to $120,000 (HEC 2008:62 [Appendix E]). Earnings by employees at the Lake Tahoe Golf Course are estimated to increase $37,700 per year with a reconfigured 18-hole regulation course.

The golf course's driving range is used as a snowmobile track during winter. The snowmobile track at the golf course would be closed during the construction season because the driving range is the main construction staging area for the proposed project. However, this closure would be short term (3–4 years). Earnings impacts from potential cessation of snowmobile ride operations were not estimated in the economic study; however, it would be expected that earnings impacts of the snowmobile ride operations would be minor compared to the earnings impacts of changes in golf operations. Therefore, no financial impact is estimated for winter operations (i.e., snowmobiling on the driving range) with changes to the golf course under Alternative 2.

Alternative 2 would therefore have an overall minor, but beneficial economic effect on the community of South Lake Tahoe.

No mitigation is required.

IMPACT 3.15-3 (Alt. 2)	Environmental Justice. *Lake Tahoe Golf Course would be reconfigured under Alternative 2, but effects on minority or low-income populations are not expected to occur.* No impact *would occur.*

Under Alternative 2, Lake Tahoe Golf Course would be reconfigured, but the current uses would continue. There is no indication that either the construction or operation of the Alternative 2 would affect identified minority or low-income populations to a greater degree than the general population of the surrounding area. Potential short-term impacts, such as construction emissions and elevated noise levels, would not have a disproportionately adverse impact on low-income or minority populations. They would affect the general population in the surrounding area, not just low-income or minority populations. In addition, appropriate measures associated with potentially significant impacts would reduce those impacts to a level below significance. Current and proposed uses at the Lake Tahoe Golf Course do not represent a disproportionate effect on low-income or minority populations.

Therefore, no significant long-term or short-term disproportionate adverse impacts on low-income or minority populations would result from implementation of Alternative 2. No significant impacts related to environmental justice would occur.

No mitigation is required.

IMPACT 3.15-4 (Alt. 2)	Fiscal Impact on State Parks. *Operation of Lake Tahoe Golf Course with a reconfigured 18-hole regulation course is expected to be feasible (i.e., estimated golf course revenue would exceed operating expenditures after making concession payments to State Parks).* No adverse *fiscal impact on State Parks would occur.*

Based on research presented in the Lake Tahoe Golf Course Economic Feasibility Analysis as to whether a modified/renovated 18-hole regulation course would increase, decrease, or have no effect on the total number of rounds played yielded no definitive evidence what the outcome might be. Reconfiguration of the championship course in Incline Village during the 2003-2004 seasons did not appear to have substantially influenced the number of rounds played at that golf course. Based on the research conducted, the number of rounds played under Alternative 2 would not change compared with existing conditions. Ultimately, the number of rounds played would be determined based on customer preferences and the excellence of course design. Although the number of rounds are not expected to increase under Alternative 2, it should be noted that there is potential for a minor price increase, which could slightly increase the projected revenues. Currently Lake Tahoe Golf Course is the most affordable golf course for 18-hole regulation play in the region. The maximum allowable fees are controlled by State Parks. Because most players are visitors who have already allocated leisure time to recreate, and because the local golfers are unlikely to be able to play twice as much even if the price is halved, demand at Lake Tahoe Golf Course is likely to be fairly price inelastic, meaning that a moderate price increase would not greatly decrease demand for play and that a moderate price decrease would not greatly increase rounds played (HEC 2008:8 [Appendix E]).

Estimated gross receipts (revenues) determine payments to State Parks. Rent to State Parks and contributions to the CIP fund are deducted from net revenues to estimate net annual concessionaire revenues. A well-designed, reconfigured 18-hole regulation course that takes maximum advantage of the terrain and vistas is projected to have financial performance similar to that currently experienced at Lake Tahoe Golf Course. Under the base case scenario, which uses data averaged from years 2003-2006, total revenue at the Lake Tahoe Golf Course is $2,789,000. Under Alternative 2, total annual revenue is estimated at $2,809,000. This expected increase is attributed to increased spending associated with golf-related food, beverage and events (HEC 2008:Table 22 [Appendix E]).Because revenues are projected to increase slightly over existing conditions, State Parks may receive a slight increase in revenues (approximately $6,000) with a reconfigured 18-hole regulation course (HEC 2008:Table 2 [Appendix E]).

The golf course's driving range is used as a snowmobile track during winter. The snowmobile track at the golf course would be closed during the construction season because the driving range is the main construction staging area for the proposed project. However, this closure would be short term (3–4 years). In addition, snowmobiling revenues and costs are variable, primarily a function of the weather (snowfall), and are minor compared to golf course revenue. No financial impact is estimated for winter operations (i.e., snowmobiling on the driving range) with changes to the golf course under Alternative 2. Golf course concessionaire revenue is estimated to decrease by approximately $25,000 annually, from $614,000 under existing conditions to $589,000, because expenses associated primarily with labor are estimated to increase.

Although the concessionaire's revenue would decrease, revenue to State Parks would slightly increase. For this reason, no adverse fiscal impacts would occur to State Parks.

Alternative 3: River Ecosystem Restoration with Reduced Play Golf Course

IMPACT 3.15-1 (Alt. 3)	Population, Employment, and Housing. *Implementing Alternative 3 would result in short-term and long-term changes in population, employment, and housing. This impact would be* ***less than significant****.*

Population, employment, and housing impacts under Alternative 3 would be similar to those under Alternative 2. Alternative 3 does not include the development of residential uses; therefore, there would be no direct contribution to local or regional growth in population or housing. It is estimated that 29–55 jobs (11–16 of which are at the Lake Tahoe Golf Course) would be removed from the local economy. Therefore, implementing Alternative 3 would not result in indirect housing demands and population growth through project-induced in-migration to the region.

Implementing Alternative 3 would require construction activities and a construction schedule similar to those for Alternative 2 and would result in loss of golf course jobs after implementation. The increase in employment associated with construction, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand.

Therefore, implementing Alternative 3 is not expected to result in significant impacts on population, employment, or housing on either a localized or a regional basis. The impact would be less than significant.

No mitigation is required.

IMPACT 3.15-2 (Alt. 3)	**Economic Impact on the Community.** *Alternative 3 would involve changes to the Lake Tahoe Golf Course that would alter tax revenue, jobs, and earnings associated with the golf course. This would be an* ***adverse economic impact****.*

According to the Lake Tahoe Golf Course Economic Feasibility Analysis, a nontraditional, or 9-hole reduced play golf course or 18-hole executive golf course, would affect total visitor spending and total number of jobs in the South Lake Tahoe area (outside Lake Tahoe Golf Course) compared to existing conditions. The total number of Lake Tahoe Golf Course–generated visitors is currently 8,942, with total annual spending estimated at $7,476,000. Under Alternative 3, it is estimated that the total number of visitors would decrease to between 5,048 and 7,192 annually, depending on the assumed number of rounds that would be played at a nontraditional golf course (HEC 2008:61 [Appendix E]). Total visitor spending would decrease to between $3,881,000 and $5,860,000. Total Lake Tahoe Golf Course estimated revenue would decrease from $2,789,000 to between $1,027,000 and $1,698,000 (HEC 2008: Table 22 [Appendix E]). Total annual tax revenue generated from both sales and property tax would decrease from $118,000 to between $98,000 and $110,000 (HEC 2008: 62 [Appendix E]).

Under Alternative 3, 29–55 jobs (11–16 of which are at the Lake Tahoe Golf Course) would be removed from the local economy. Earnings by employees generated elsewhere in South Shore by visitors to the Lake Tahoe Golf Course would decrease by $287,000–880,000 annually with a nontraditional course (HEC 2008:6 [Appendix E]). Earnings by employees at the Lake Tahoe Golf Course would decrease by approximately $81,300–117,900 per year.

The golf course's driving range is used as a snowmobile track during winter. The snowmobile track at the golf course would be closed during the construction season because the driving range is the main construction staging area for the proposed project. However, this closure would be short term (3–4 years). Earnings impacts from potential cessation of snowmobile ride operations were not estimated in the economic study; however, it would be expected that earnings impacts of the snowmobile ride operations would be minor compared to the earnings impacts of changes in golf operations. Therefore, no financial impact is estimated for winter operations (i.e., snowmobiling on the driving range) with changes to the golf course under Alternative 3.

Existing total additional Lake Tahoe Golf Course revenues and tax revenue benefiting the local economy are estimated at $6.1 million annually. These revenues would be reduced to between approximately $3.5 million and $5.2 million with a nontraditional golf course (HEC 2008:7 [Appendix E]). Implementing Alternative 3 would therefore have an overall adverse economic impact on the community of South Lake Tahoe.

IMPACT 3.15-3 (Alt. 3)	**Environmental Justice.** *Under Alternative 3, the Lake Tahoe Golf Course would be either a 9-hole golf course or an 18-hole executive golf course, but impacts on minority or low-income populations are not expected to occur.* ***No impact*** *would occur.*

Under Alternative 3, the Lake Tahoe Golf Course would be reduced in size and modified to either a 9-hole course or an 18-hole executive course. There is no indication that either the construction or operation of Alternative 3 would affect identified minority or low-income populations to a greater degree than the general population of the surrounding area. As with Alternative 2, potential short-term impacts, such as construction emissions and elevated noise levels, would not have a disproportionately adverse impact on low-income or minority populations. They would affect the general population in the surrounding area, not just low-income or minority populations. In addition, appropriate measures associated with potentially significant impacts would reduce those impacts to a level below significance. For any significant and unavoidable impacts, TRPA is required to make findings as to whether the project's benefits would outweigh the significant and unavoidable environmental impact. Current and proposed uses at the Lake Tahoe Golf Course do not represent a disproportionate effect on low-income or minority populations.

Therefore, no significant long-term or short-term disproportionate adverse impacts on low-income or minority populations would result from implementation of Alternative 3. No impacts related to environmental justice would occur.

No mitigation is required.

IMPACT 3.15-4 (Alt. 3)	Fiscal Impact on State Parks. *Operation of Lake Tahoe Golf Course with a nontraditional golf course is estimated to be infeasible (i.e., golf course revenue may not exceed operating expenditures after making concession payments to State Parks). This would be an* **adverse** *fiscal impact on State Parks.*

As discussed for Alternative 2, estimated gross receipts (revenues) determine rent and CIP payments to State Parks. Rent to State Parks and contributions to the CIP fund are deducted from net revenues to estimate net annual concessionaire revenues. Currently, total revenue at the Lake Tahoe Golf Course is $2,789,000. Under Alternative 3, annual total revenue is estimated to range between $1,027,000 (low number of assumed rounds and low fees) and $1,698,000 (high number of assumed rounds and high fees) (HEC 2008:4 [Appendix E]). Currently, State Parks receives an average of $881,000 annually. Because revenues are projected to decrease over existing conditions, State Parks would receive between $324,000 and $536,000 (HEC 2008:4 [Appendix E]). Additionally, implementing Alternative 3 would result in negative cash flow to the concessionaire, resulting in losses ranging from $262,000 to $23,000. If the reconfigured golf course can achieve more than 25,000 rounds annually and command green fees above the median rack rate for comparable Tahoe nontraditional length facilities, it may be financially feasible, netting revenues to the concessionaire of $93,000 (HEC 2008:4 [Appendix E]). However, net revenues in this amount would be considered marginal, making the golf course susceptible to closure and eliminating or drastically reducing income to State Parks.

The golf course's driving range is used as a snowmobile track during winter. The snowmobile track at the golf course would be closed during the construction season because the driving range is the main construction staging area for the proposed project. However, this closure would short term (3–4 years). In addition, snowmobiling revenues and costs are variable, primarily a function of the weather (snowfall), and are minor compared to golf course revenue. No financial impact is estimated for winter operations (i.e., snowmobiling on the driving range) with changes to the golf course under Alternative 3. It should be noted that Lake Tahoe Golf Course is the most affordable golf course for 18-hole regulation play in the region. The maximum allowable fees are controlled by State Parks. Because most players are visitors who have already allocated leisure time to recreate, and because the local golfers are unlikely to be able to play twice as much even if the price is halved, demand at Lake Tahoe Golf Course is likely to be fairly price inelastic, meaning that a moderate price decrease would not greatly increase rounds played (HEC 2008:8 [Appendix E]).

A nontraditional golf course is estimated to be financially infeasible under all but the most optimistic of circumstances (assuming high number of rounds and high fees) because the concessionaire would have a negative cash flow after making payments to State Parks. Payments to State Parks would be substantially reduced. Fiscal impacts on State Parks under Alternative 3 would be adverse.

Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course

IMPACT 3.15-1 (Alt. 4) **Population, Employment, and Housing.** *Alternative 4 would not involve any changes to the Lake Valley SRA, Lake Tahoe Golf Course, or Washoe Meadows SP. However, implementing Alternative 4 would result in short-term changes in population, employment, and housing. This impact would be* ***less than significant****.*

Alternative 4 does not involve any changes to the Lake Valley SRA, the facilities of and uses at the Lake Tahoe Golf Course, or Washoe Meadows SP. All existing recreational facilities would remain unchanged. The number of jobs and employee earnings would also remain unchanged. Housing would not be affected because there would be no new population or demand generated under Alternative 4.

Implementing Alternative 4 would, however, require construction activities and a construction schedule similar to those for Alternative 2 because it would involve stabilization of the river. The increase in employment associated with construction, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand.

Therefore, implementing Alternative 4 is not expected to result in significant impacts on population, employment, or housing on either a localized or a regional basis. The impact would be less than significant.

No mitigation is required.

IMPACT 3.15-2 (Alt. 4) **Economic Impact on the Community.** *Alternative 4 would not involve any changes to the Lake Tahoe Golf Course. Economic impacts on the community would not occur.* ***No impact*** *would occur.*

This impact is the same as Impact 3.15-2 (Alt. 1). For the same reasons as described for Alternative 1, there would be no impact.

No mitigation is required.

IMPACT 3.15-3 (Alt. 4) **Environmental Justice.** *Alternative 4 would involve only minor changes to the Lake Tahoe Golf Course. Impacts on minority or low-income populations would not occur.* ***No impact*** *would occur.*

This impact is the same as Impact 3.15-3 (Alt. 1). For the same reasons as described for Alternative 1, there would be no impact.

No mitigation is required.

IMPACT 3.15-4 (Alt. 4) **Fiscal Impact on State Parks.** *Alternative 4 would involve only minor changes to the Lake Tahoe Golf Course. There would be no changes to State Parks revenues.* ***No impact*** *would occur.*

This impact is the same as Impact 3.15-4 (Alt. 1). For the same reasons as described for Alternative 1, there would be no impact.

No mitigation is required.

Alternative 5: River Ecosystem Restoration with Decommissioned Golf Course

IMPACT 3.15-1 (Alt. 5) **Population, Employment, and Housing.** *Implementing Alternative 5 would result in short-term and long-term changes in population, employment, and housing. This impact would be* ***less than significant****.*

Population, employment, and housing impacts associated with implementation of Alternative 5 would be similar to those of Alternative 2 during construction and would result in loss of golf course jobs after implementation. Alternative 5 does not include the development of residential uses; therefore, there would be no direct contribution to local or regional growth in population or housing. However, it is projected that the total number of employees would decrease to 32 (HEC 2008:45 [Appendix E]), if operating just the event facility is feasible. Otherwise all concessionaire jobs would be lost. As a result, implementing Alternative 5 would not result in indirect housing demands or population growth through project-induced in-migration to the region.

Under Alternative 5, construction activities would include decommissioning and removing the existing golf course, removing bridges, and constructing and modifying the river channel and floodplain surfaces. Implementing Alternative 5 would require a construction schedule similar to that for Alternative 2. The increase in employment associated with construction, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand.

Therefore, implementing Alternative 5 is not expected to result in significant impacts on population, employment, or housing on either a localized or a regional basis. The impact would be less than significant.

No mitigation is required.

IMPACT 3.15-2 (Alt. 5) **Economic Impact on the Community.** *Lake Tahoe Golf Course would be decommissioned under Alternative 5. Tax revenue, jobs, and earnings associated with the golf course would no longer exist. This would be an* ***adverse economic impact****.*

Under Alternative 5, the Lake Tahoe Golf Course would be decommissioned. The clubhouse would remain; however, the future use of this facility would be determined through a separate planning process conducted at a later time. Snowmobiling would be discontinued because the snowmobile track on the driving range would be decommissioned along with the golf course. Other winter recreation activities (i.e., snowshoeing, cross-country skiing) would continue informally in the study area. In the short term, the golf course portion of the study area would be closed for construction and staging, and winter recreation opportunities within this portion of the study area would not be available.

According to the Lake Tahoe Golf Course Economic Feasibility Analysis, the total number of Lake Tahoe Golf Course–generated visitors is currently 8,942, with total annual visitor spending estimated at $7,476,000. Under Alternative 5, if the clubhouse remained in operation for events, it is estimated that the total number of visitors would decrease to 1,832 and that total annual visitor spending would decrease to $912,000 (HEC 2008:61 [Appendix E]). Total annual estimated tax revenue directly generated by Lake Tahoe Golf Course visitors would decrease from $493,000 to $128,000 (HEC 2008:62 [Appendix E]). The closure of the golf course would result in the loss of approximately 168 full- and part-time jobs (76 at Lake Tahoe Golf Course and 92 elsewhere) from the local economy. The loss in earnings associated with these jobs is approximately $2.7 million, which is money no longer recirculated in the local economy (HEC 2008:63 [Appendix E]). Closure of winter operations would result in the loss of approximately three jobs (HEC 2008:8 [Appendix E]). Earnings by employees generated elsewhere in South Shore by visitors to Lake Tahoe Golf Course would decrease by $2.0 million with no golf course (HEC 2008:6 [Appendix E]). Earnings impacts from potential cessation of snowmobile ride operations were not estimated in the economic study; however, it would be expected that earnings impacts of the snowmobile ride operations would be minor compared to the earnings impacts of changes in golf operations. The economic impact of decommissioning Lake Tahoe Golf Course and no longer providing any public services at Lake Valley SRA is approximately $7.5 million in direct visitor spending and $0.5 million in tax revenue, for a total of $8.0 million (HEC 2008:63 [Appendix E]). These revenues would be lost under Alternative 5 and would therefore have an overall adverse economic impact on the community of South Lake Tahoe.

IMPACT 3.15-3 (Alt. 5)	**Environmental Justice.** *Lake Tahoe Golf Course would be decommissioned under Alternative 5, but impacts on minority or low-income populations are not expected to occur.* ***No impact*** *would occur.*

Under Alternative 5, the Lake Tahoe Golf Course would be decommissioned, and the clubhouse and maintenance yard would remain; however, the future use of this facility would be determined through a separate planning process based on comments submitted on this draft EIR/EIS/EIS and consideration of compatible State Parks uses. There is no indication that either the construction or the operation of Alternative 5 would affect identified minority or low-income populations to a greater degree than the general population of the surrounding area. Potential impacts would affect the general population in the surrounding area, not just low-income or minority populations. In addition, appropriate measures associated with potentially significant impacts would reduce those impacts to a level below significance. For any significant and unavoidable impacts, TRPA is required to make findings as to whether the project's benefits would outweigh the significant and unavoidable environmental impact. Current and proposed uses at the Lake Tahoe Golf Course do not represent a disproportionate effect on low-income or minority populations.

Therefore, no significant long-term or short-term disproportionate adverse impacts on low-income or minority populations would result from implementation of Alternative 5. No significant impacts related to environmental justice would occur.

No mitigation is required.

IMPACT 3.15-4 (Alt. 5)	**Fiscal Impact on State Parks.** *Decommissioning the Lake Tahoe Golf Course while maintaining the clubhouse for event purposes only is estimated to be financially infeasible (i.e., revenue would not exceed operating expenditures after making concession payments to State Parks). This would be an* ***adverse*** *fiscal impact on State Parks.*

As discussed for Alternative 2, estimated gross receipts (revenues) determine payments to State Parks. Rent to State Parks and contributions to the CIP fund are deducted from net revenues to estimate net annual concessionaire revenues. Currently, total revenue at the Lake Tahoe Golf Course is $2,789,000. Under Alternative 5, total revenue would decrease to $387,000 if the clubhouse continued to host events, if not income would be zero (HEC 2008:4 [Appendix E]). Operation of the clubhouse for events only is estimated to be infeasible, even if the number of events is doubled per year. Concessionaire operations would have to cease because operating expenditures would exceed revenues (HEC 2008:3 [Appendix E]). If operation of the clubhouse is infeasible for a concessionaire, it would also not be expected to produce positive cash flow if operated by State Parks staff directly (and the State Parks District does not have staff available for such an operation). Therefore, operation of the clubhouse for special events would be infeasible with either operating model.

Under Alternative 5, potential annual loss of income to State Parks from decommissioning and removing the Lake Tahoe Golf Course is $881,000 (HEC 2008:3 [Appendix E]). Fiscal impacts on State Parks under Alternative 5 would be adverse.

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3.16 CUMULATIVE IMPACTS

This chapter provides an analysis of overall cumulative impacts of the project alternatives and the No Project/ No Action alternative taken together with other past, present, and reasonably foreseeable future projects producing related impacts, as required by the California Environmental Quality Act Guidelines (State CEQA Guidelines) (14 California Code of Regulations (CCR) Section 15130) and National Environmental Policy Act (NEPA) implementing regulations (40 Code of Federal Regulations [CFR] 1508.7). This analysis follows applicable guidance provided by the Council on Environmental Quality (CEQ) in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) and in *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005) and applicable Reclamation guidance and directives provided in the public review draft of Reclamation's *NEPA Handbook* (2000), (the latter of which is used as informal guidance, because it is currently being revised).

3.16.1 DEFINITIONS OF CUMULATIVE IMPACTS

The significance criteria for environmental effects are the same for cumulative impact analysis as they are for the project related impacts. These significance criteria are described in each of the topical environmental consequences sections of this chapter. The cumulative impact analysis is different, however, in that it accounts for the combination of environmental effects from other past, present, and reasonably foreseeable future projects potentially causing related impacts, not just the effects of the singular proposed project. Definitions of cumulative impacts and the scope of the cumulative impact analysis are discussed below.

NEPA DEFINITION OF CUMULATIVE IMPACTS

The CEQ regulations that implement provisions of NEPA define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions over time and differ from indirect impacts (40 CFR 1508.8). They are caused by the incremental increase in total environmental effects when the evaluated project is added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can thus arise from causes that are totally unrelated to the project being evaluated, and the analysis of cumulative impacts looks at the life cycle of the effects, not the project at issue. These impacts can be either adverse or beneficial.

TRPA DEFINITION OF CUMULATIVE IMPACTS

TRPA looks to NEPA and CEQA for guidance in assessing cumulative impacts (and thus the analysis contained in this document is sufficient for TRPA purposes).

CEQA DEFINITION OF CUMULATIVE IMPACTS

Cumulative impacts are defined in the State CEQA Guidelines (CCR Section 15355) as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CCR Section 15355(b)).

Consistent with the State CEQA Guidelines (CCR Section 15130(a)), the discussion of cumulative impacts in this chapter focuses on significant and potentially significant cumulative impacts. The State CEQA Guidelines (CCR Section 15130(b)) state that:

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

3.16.2 CUMULATIVE ANALYSIS APPROACH

GEOGRAPHIC SCOPE OF EFFECTS OF THE PROJECT

Table 3.16-1 defines the geographic scope of the effects of the proposed action and alternatives for each of the resource topics addressed in this draft EIR/EIS/EIS.

Table 3.16-1
Geographic Areas That Would Be Affected by the Project

Resource Area	Geographic Area
Air quality	Lake Tahoe Air Basin
Archaeological and Historical Resources	Study area, with regional implications
Vegetation and Wildlife	Project vicinity and watershed of the Upper Truckee River, with regional implications
Fisheries	Watersheds of Trout Creek and the Upper Truckee River, with regional implications
Earth Resources	Study area
Human Health and Risk of Upset	Study area
Hydrology and Flooding	Project vicinity and watershed of the Upper Truckee River
Geomorphology and Water Quality	Project vicinity and watershed of the Upper Truckee River, with implications for Lake Tahoe
Land Use	Project vicinity
Noise	Project vicinity
Public Services	South shore of Lake Tahoe
Recreation	South shore of Lake Tahoe
Scenic Resources	Project vicinity
Socioeconomics, Environmental Justice, and Public Housing	South shore of Lake Tahoe and project vicinity
Transportation, Parking, and Circulation	South shore of Lake Tahoe
Utilities	South shore of Lake Tahoe
Global Climate Change	Upper Truckee River watershed for related projects, although cumulative consequence issues can be global.

Source: Data compiled by EDAW (now AECOM) in 2009.

PLANNING CONTEXT

Land use plans adopted for areas within the geographic scope of analysis provide guidance for future projects. These plans are described below.

USFS Land and Resource Management Plan

The *Land and Resource Management Plan Lake Tahoe Basin Management Unit* (Forest Plan) (USFS 1988) directs USFS management of the Lake Tahoe Basin Management Unit (LTBMU). It provides management direction that applies to the entire LTBMU and additional direction for specific management areas within the LTBMU. The study area for the proposed project is in the Tahoe Valley Management Area. For this area, the emphasis of USFS management is on satisfying the recreational, scenic, and special use demands of the large visiting and urban population; and some USFS land is managed for existing and potential development (which may include construction of new recreational facilities). The USFS is currently revising the Forest Plan. A Notice of Intent to prepare an environmental impact statement to develop a new planning rule to replace the 2008 Planning Rule that was overturned by the courts was published in 2009. Rather than wait for the publication of a new final rule, the LTBMU will complete their revisions using the 2000 planning rule. The 2000 Planning Rule allows the Forest Service to use the provisions of the 1982 Planning Rule to develop, amend and revise plans while the agency develops a new rule. The LTBMU 2000 Planning Rule principles include:

- Conducting restoration and conservation to address ecosystem resilience;
- Proactively addressing climate change;
- Maintaining and restoring watershed health and protecting and enhancing water resources;
- Providing for diversity of species and wildlife habitat;
- Fostering sustainable NFS lands and their contribution to vibrant rural economies;
- Conducting effective and pro-active collaboration with the public;
- Considering the relationship between NFS lands and neighboring lands; and
- Using the latest planning science and principles to achieve the best decision possible.

El Dorado County General Plan

The El Dorado County General Plan provides direction for local land use decisions in the unincorporated portions of El Dorado County. This guidance would be applicable to private and locally owned lands in the watershed of the Upper Truckee River that are outside of the City of South Lake Tahoe. The El Dorado County General Plan consists of 9 elements: land use; transportation and circulation; housing; public services and utilities; health, safety, and noise; conservation and open space; agriculture and forestry; parks and recreation; and economic development. Goals, objectives, and policies, and implementation measures are provided for each of these elements. Although no goals, objectives, policies, or measures specifically refer to Washoe Meadows State Park (SP), Lake Valley State Recreation Area (SRA), or the Upper Truckee River some are relevant to the proposed project. In particular, Goal 2.10 ("Lake Tahoe Basin") provides direction for land use decisions by El Dorado County in the Lake Tahoe Basin. This goal is: "To coordinate the County's land use planning efforts in the Tahoe Basin with those of the Tahoe Regional Planning Agency" (El Dorado County Planning Department 2004). Other applicable goals, objectives, and actions are discussed further in Section 3.2, "Land Use."

South Lake Tahoe General Plan

The study area is located outside of the City of South Lake Tahoe. However, the land use vision described in the general plan specifically addresses the commercial corridor along U.S. Highway 50 (U.S. 50) adjacent to the study area. The vision is to remove the "strip commercial uses" and reestablish distinct "villages" reminiscent of early South Shore development along the highway (City of South Lake Tahoe 2003). The goals and policies of the general plan are the basis upon which the city council and planning commission will base their land use decisions (OPR 2001). The general plan for the City of South Lake Tahoe (City of South Lake Tahoe 2003) consists of seven elements: land use, circulation, housing, conservation, open space, noise, and safety. Goals, objectives, and actions are provided for each of these elements. Although no goals, objectives, or actions specifically refer to the SP or SRA, many are applicable to the study area. These goals, objectives, and actions are summarized in Section 4.10, "Land Use." The City's general plan is currently being revised.

Lake Tahoe Airport Comprehensive Land Use Plan

The *Lake Tahoe Airport Comprehensive Land Use Plan* (Brand and French 1990), prepared by the City of South Lake Tahoe, defines compatible types and patterns for any future development that might occur in the area surrounding the Lake Tahoe Airport, including the project vicinity. The findings, policies, and guidelines of this plan have three major functions:

- To protect the airport from encroachment by incompatible land uses;
- To safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general by protecting them from the adverse effects, related hazards; and
- To ensure that no structures effect navigable airspace.

To limit the potential consequences of an off-airport accident, the plan limits the intensity of land uses (measured as the number of people potentially present per acre) in some areas. The plan also includes guidelines regarding the compatibility of land uses. Because bird-plane collisions (i.e., bird strikes) are a hazard to the operation of aircraft, land uses that potentially attract hazardous wildlife are a safety concern that is addressed by the plan.

Lake Valley SRA General Plan

Section 5002.2 of the Public Resources Code requires State Parks to prepare a general plan or revise any existing plan after the State Park and Recreation Commission has classified or reclassified a unit of the State Park system, and before any new permanent facilities are developed in a previously classified unit. To satisfy this requirement for the unit in which the study area for this project is located, State Parks prepared and adopted the *Lake Valley State Recreation Area General Plan* on May 13, 1988 (State Parks 1988). The general plan provides guidelines for long-term management and development of Lake Valley SRA. The Land Use Element of the general plan determines uses of land within the SRA for providing recreational opportunities and public facilities consistent with the programs and policies identified in the general plan's Resource Element. It identifies developed and undeveloped land uses and provides recommendations for future uses within the SRA. Specifically, the purpose of Lake Valley SRA is to make available an 18-hole golf course and the scenic Upper Truckee River and its environs for people's enjoyment and inspiration. State Parks must balance the objectives of providing optimum recreational opportunities and maintaining the highest standards of environmental protection. According to the General Plan purpose statement, State Parks must define and execute a management program for the unit that perpetuates the unit's declared values, providing for golfing and other compatible summer and winter recreation opportunities while restoring the natural character and ecological values of the Upper Truckee River, protecting its water quality, and protecting and interpreting significant natural, cultural, and scientific values. No general plan has been prepared for Washoe Meadows State Park.

Lake Valley State Recreation Area River Management Plan—Upper Truckee River

The *Lake Valley State Recreation Area River Management Plan—Upper Truckee River* (State Parks 2000) was an internal planning study that provides guidelines for the management and development of Lake Valley SRA. The plan's major theme is combining river enhancement and erosion control with recreation enhancement. Resource objectives include implementing rehabilitation within the Upper Truckee River without moving the golf course, protecting and enhancing scenic quality, and monitoring modifications. Objectives related to recreation include redevelopment that considers effects on the river (e.g., control of runoff into the river, implementation of best management practices, experimental use of more tolerant turf and grass species). In general, the plan calls on State Parks to:

- recreate the riparian corridor along the Upper Truckee River;
- protect the existing characteristics of the river corridor and riparian values;
- restore or rehabilitate disturbed areas, and enhance all other areas;
- enhance the golfing experience and improve the facilities;
- protect, preserve, and enhance the area's scenic quality; and
- protect, restore, and enhance wildlife and fisheries habitat values.

This plan was never completed and adopted because it did not meet the goals in the General Plan to restore the Upper Truckee River. Its information was superseded by the *Upper Truckee River Restoration Project – Riparian Ecosystem Restoration Feasibility Report* (River Run Consulting 2006), which provided the foundation information for developing the river restoration concepts of the proposed project. Consequently, the River Management Plan does not provide direction to current restoration planning efforts at Lake Valley SRA.

TRPA Regional Plan

The Lake Tahoe Regional Plan provides the overall planning framework for TRPA decisions in the Basin. The framework of the Regional Plan includes thresholds, goals and policies, a code of ordinances, and Plan Area Statements (PASs). Each of these components of the Regional Plan is described below. The Regional Plan is being updated through the Pathway, which is a multi-agency collaborative process described in a subsequent section (entitled "Pathway").

Environmental Thresholds

Thresholds are used by TRPA as standards for evaluating projects. TRPA threshold criteria have been established for the following environmental resource topics: water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation.

Both attainment and maintenance of the thresholds are required, and TRPA does not have flexibility in its enforcement when evaluating projects. An effect on exceedance of these threshold criteria must be mitigated by avoidance, relocation, or removal of the identified project element that would cause the effect on exceedance (TRPA 1982). The consequences of each alternative for the thresholds are addressed in the applicable resource evaluations in Chapter 4 of this document.

Goals and Policies

The Goals and Policies document for the 1987 Regional Plan establishes an overall framework for development and environmental conservation in the Lake Tahoe region (TRPA 1986). This document identifies goals and policies that establish the strategies necessary to achieve the goals.

Code of Ordinances

The TRPA Code of Ordinances establishes standards and regulations for implementation of the Regional Plan for the Lake Tahoe Basin. The Code of Ordinances is intended to implement the Goals and Policies of the Regional Plan while maintaining the environmental thresholds (TRPA 1991). Public agencies and organizations in the Lake Tahoe Basin must comply with TRPA provisions or may establish equivalent or higher requirements in their jurisdiction.

Plan Area Statements

The TRPA Code of Ordinances requires that all projects and activities be consistent with the provisions of a particular area's applicable PAS. The Lake Tahoe Region is divided into more than 175 separate Plan Areas. For each Plan Area, a "statement" is made as to how that particular area should be regulated to achieve regional environmental and land use objectives and provide detailed plans and policies for specific areas of the basin. The Plan Area's written text and maps, as well as the other land use regulations, provide specific land use policies and regulations for a specific planning area. The project area is located within PAS 119 (Country Club Meadow). The PAS is described in Section 3.2, "Land Use."

Pathway

Pathway is a collaborative planning effort between TRPA, USFS, the Lahontan RWQCB, and NDEP. Through Pathway, these agencies are working together to align environmental goals and develop integrated regional plans for the Tahoe Basin. The elements of Pathway include:

- developing the Lake Tahoe total maximum daily loads,
- updating TRPA's Environmental Thresholds and 20-Year Regional Plan, and
- updating the USFS Land and Resource Management Plan.

Each of the Pathway efforts is being undertaken using an adaptive management framework to provide ongoing opportunities for review and revision of the success of regulations and policies.

METHODS AND ASSUMPTIONS OF ANALYSIS

Although NEPA guidelines do not provide specific guidance on how to conduct a cumulative impact analysis, the U.S. Department of the Interior, Bureau of Reclamation's draft *NEPA Handbook* states that an EIS should identify associated actions (past, present, or future) that, when viewed with the proposed or alternative actions, may have significant cumulative impacts. Cumulative impacts should not be speculative, but should be based on known long-range plans, regulations, or operating agreements.

The State CEQA Guidelines identify two basic methods for establishing the cumulative environment in which the project is to be considered: the use of a list of past, present, and probable future projects (the "list approach") or the use of adopted projections from a general plan, other regional planning document, or certified EIR for such a planning document (the "plan approach"). For this cumulative effects analysis, the list approach has been followed to generate the most reliable future projections possible.

Significance Criteria

When considering cumulative impacts of the Upper Truckee River Restoration and Golf Course Reconfiguration Project, the environmental consequences of actions associated with the project were evaluated to determine if implementation would make a cumulatively considerable contribution to a significant cumulative effect. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other projects, and the effects of probable future projects (CEQA Guidelines 15065[a][3]). Thus, the action's effects were evaluated in combination with the effects of other past, present, and reasonably foreseeable future actions to determine if (1) the overall cumulative effect is significant and (2) the action contributes to that overall cumulative effect. Both circumstances must exist to conclude that an environmental consequence is cumulatively significant. Cumulatively significant effects of would do any of the following:

- Cause a significant adverse effect on a resource (using the criteria for significance described in Chapter 3, "Environmental Consequences and Mitigation Measures");

- Make a considerable contribution to an already degraded or declining resource that has experienced substantial adverse effects from other past, present, or reasonably foreseeable future projects; or

- Cause an effect that was initially not significant by itself, but that would be part of a cumulatively degrading or declining future trend resulting from other reasonably foreseeable future actions.

Short-term, and Long-term Cumulative Impacts

Because the project involves the restoration of natural functions and values to a river and floodplain through construction activity, short-term impacts may occur as a result of the construction disturbance. Therefore, the analysis needs to examine whether short-term cumulative impacts may occur because of the implementation of a combination of the Upper Truckee River Restoration and Golf Course Reconfiguration Project and other past, present, and reasonably foreseeable future projects in the watershed.

Short-term impacts include both effects that would be transient and are related to construction (e.g., noise) and effects that would last for approximately 3–5 years that are related to an adjustment period after construction. Following construction activities, restoration involves a transitional period during which the project area will adjust and evolve to mimic the natural environment prior to project implementation. Vegetation will grow and develop into fuller cover over the river channel and soils exposed during construction, wildlife habitats will reestablish themselves or develop for the first time, and the river will equilibrate. The short-term cumulative impact analysis time period, therefore, involves the construction phase of the project and approximately 5 years thereafter.

In this cumulative impact analysis, short-term impacts are addressed separately from long-term cumulative impacts. Typically, such transitory effects do not result in a cumulatively significant impact, because they do not add to the effects of other actions. However, the construction and transitional periods of the proposed restoration project could be concurrent with the construction and transitional periods of several other restoration and erosion control actions in the Upper Truckee River watershed (see Table 3.16-2). Thus, the combined and short-term effects of these restoration and related actions (including the proposed project) could be cumulatively significant for certain resources (e.g., water quality), and are, therefore, discussed in this section. Also, the short-term effects on a resource could be adverse, while long-term effects to the same resource are beneficial. (For example, the temporary risk of construction-period sedimentation or transitional-period erosion could be adverse, even though the project is implementing its purpose to create long-term benefits to water quality.) For these reasons, the cumulative impacts resulting from temporary and short-term effects are distinguished from long-term impacts in the analysis and conclusions regarding cumulative impacts.

Long-term cumulative impacts are the more common subject of cumulative impact analysis. Adverse effects typically accumulate over time as a result of the implementation of a combination of projects. Because this environmental document examines a proposed restoration project, long-term cumulative environmental effects could be either adverse or beneficial, both of which are considered in this analysis. Long-term cumulative impacts are discussed for each resource following short-term cumulative impacts, if both are applicable.

Mitigation Measures for Cumulative Impacts

Where a considerable contribution to a significant cumulative adverse effect is identified, mitigation measures are presented, where feasible. If mitigation described in Sections 3.2–3.15 for project-related impacts would also resolve cumulative impacts, it is cross-referenced in the discussion below. If a new mitigation measure is needed for the cumulative impact, it is described in its entirety in the following discussion.

RELATED PROJECTS CONSIDERED IN CUMULATIVE IMPACT ANALYSIS

Past Projects

The Upper Truckee River, its watershed, and surrounding areas, have been substantially altered by land use practices during the past 150 years. The opening of the Comstock silver mining boom in Nevada, beginning in mid-1859, prompted a surge in timber harvesting, and agricultural and developed land uses also increased. During the 1900s (to the present), developed land uses have continued to increase, particularly since 1960. For example, the population of the City of South Lake Tahoe has increased fivefold since 1960 (City of South Lake Tahoe 2003).

As a result of these changes in land use, the Upper Truckee River has experienced ecosystem degradation throughout its watershed that is typical of what has occurred elsewhere in the Tahoe Basin (Murphy and Knopp 2000). The river has been modified from its original conditions by human activities, such as logging; livestock grazing; and construction of roads, and residential, commercial, and industrial developments (including the Lake Tahoe Airport, U.S. 50 Bridge). Many of these past actions continue to affect resources of the project vicinity, Upper Truckee River watershed, and south shore of Lake Tahoe. These major past actions include the following:

- *Historic Timber Harvests*. The Comstock mining boom between 1860 and 1890 brought about substantial changes in the watershed. Loss of trees and compaction of soils from clear-cut logging and primitive log transport methods increased runoff, soil erosion, and sediment supply to the river. Intensive logging, including clear-cutting and hauling, took place in the area surrounding the Upper Truckee River below the current U.S. 50 crossing at Meyers. Straightening the channel to help move the logs downriver and constructing splash dams likely also affected the Upper Truckee River. Splash dams were temporary structures to impound the flow and create a pond where logs could be floated. Once full, the dam would be breached, sending the logs downstream to Lake Tahoe with the detained river flow (SH+G 2004:II-21).

- *Historic Grazing*. Sheep and cattle grazing were seasonal uses in the upper watershed area, particularly concentrated in meadows and lakes. The introduction of grazing to the floodplain meadow areas and the watershed would have brought pathogens, elevated nutrient levels and increased areas of soil disturbance and erosion, and loss of channel sinuosity. Grazing in the project vicinity occurred between the 1850s and the 1960s; in the Upper Watershed grazing could have started in the 1840s, and at some periods, included sheep grazing as well as cattle. Grazing along stream zones where the water course was the main supply of drinking water often resulted in “chiseled” banks with barren soils, a lack of vegetation cover and trampled substrate. The 1940s aerials indicate many barren streambanks, a wide channel with fresh bars of sediment and little indication of recent vegetation colonization. These features all suggest grazing impacts were significant in the1940s (SH+G 2004:II-29).

- *Fire Suppression*. Prior to the late-1800s, fires in the Lake Tahoe Basin were frequent and mostly of low to moderate intensity. Since that time, changes in land use and fire management have altered the frequency and intensity of fires. In particular, since about the 1920s, fire suppression has resulted in a several-fold increase in tree density and fuel loads in most forests in the Lake Tahoe Basin (Barbour et al. 2002:461–462). These changes in forest structure have altered biological habitats, and increased the frequency of high-intensity fires and the vulnerability of trees to insect outbreaks.

- *Urban Development*. During the past 150 years, a portion of the watershed of the Upper Truckee River has been converted to developed land uses. Based on a review of land cover within the watershed (using the CDF 2002 and California Interagency Watershed Mapping Committee 2004 GIS data layers), this portion is about 9 percent, concentrated in the lower elevation areas of the watershed, and includes much of the project vicinity. Urban development has been altering hydrologic, geomorphic, and other resources within the watershed of the Upper Truckee River, including the project vicinity. Several development projects along the Upper Truckee River have adversely affected geomorphic processes, water quality, and habitats; these projects include the Lake Tahoe Golf Course at the Lake Valley SRA, South Lake Tahoe Airport, U.S. 50, and the Tahoe Keys Marina and residential area.

- *Newlands Project – Tahoe City Dam*. Since 1870, a dam has been operated at Tahoe City that regulated water flow from Lake Tahoe into the Lower Truckee River. Following enactment of the Reclamation Act of 1902, the Secretary authorized construction of the Newlands Project, and during 1909–1913, the dam at Tahoe City was reconstructed to its present configuration. This dam controls the top 6.1 feet of storage at Lake Tahoe as a Federal reservoir. The Truckee River Operating Agreement governs the operation of this dam and consequently the surface elevation of Lake Tahoe (Reclamation and DWR 2008), which has an effect on the Upper Truckee River, primarily in the lower reaches.

- *Species Introductions.* Non-native species have been accidentally or deliberately introduced into the aquatic and terrestrial ecosystems of the Lake Tahoe Basin. Species that have become particularly abundant and are present in the project vicinity include beaver (*Castor canadensis*), brown trout (*Salmo trutta*), brown bullhead catfish (*Ictalurus nebulosus*), and cheatgrass (*Bromus tectorum*) (EDAW and ENTRIX 2003). Bullfrogs (*Rana catesbeiana*) have been documented in the Tahoe Basin, including the golf course ponds in the study area (McMorrow 2003, Wildlife Resource Consultants 2008a). These species have been altering the resources of the project vicinity, Upper Truckee River watershed, and south shore of Lake Tahoe.

- *Tahoe Keys Marina and Tahoe Keys Residential Area*. From the late 1950s and continuing into the 1970s, the construction of the Tahoe Keys Marina and the Tahoe Keys residential area substantially altered the Upper Truckee Marsh and the downstream reach of the Upper Truckee River. During this time, approximately 500 acres in the center of the marsh was excavated to create canals and the Tahoe Keys Marina, and fill was placed to create the housing pads of the Tahoe Keys residential area. This project fragmented the marsh into what is now known as Pope Marsh on the west and the Upper Truckee Marsh on the east. In addition, by 1965, the adjacent portion of the Upper Truckee River was channelized, which effectively disconnected it from its former floodplain (EDAW and ENTRIX 2003).

- *Lower West Side Wetland Restoration Project*. During the summers of 2001 and 2002, the Conservancy restored approximately 12 acres of former wetland that was filled during Tahoe Keys construction. The site was excavated 3–5 feet, and subsequently restored as wetland and reconnected to the Upper Truckee River as part of the active floodplain. The Lower West Side Wetland Restoration Project is located next to Tahoe Keys Marina behind Cove East Beach, west of the river.

- *Angora 3A and 3B Water Quality Project.* In 2002, El Dorado County, the Conservancy, TRPA, and USFS implemented erosion control measures within a 45-acre area along Angora Creek to reduce the quantity of fine sediment reaching Angora Creek and to reduce the peak flow of stormwater reaching Angora Creek during large storm events (El Dorado County DOT 2006). These measures included redesign and replacement of inadequately sized culverts; revegetation and other source control measures on eroding slopes; and installation of curb and gutter, rock bowls at culvert outlets, vegetated swales, and sediment traps.

- *Angora Creek Restoration Project.* Two restoration projects have been completed by State Parks on Angora Creek: 1997 and 2002. In 2002, State Parks restored a reach of Angora Creek and the adjacent meadow. A section of Angora Creek once meandered through a wet meadow, but the stream was captured by the STPUD sewer alignment in the 1960s. The stream deviated from its original winding path over the sewer giving the stream more power, causing an increase in erosive forces. The channel had down-cut, scouring the bed of the stream to two feet below its original elevation. This, in turn, caused the meadow to dry out and critical habitat was degraded. A second reach that flows through the study area was restored in 1997. That reach was channelized and diverted to dry the meadow for grazing. The golf course was later built over part of this meadow and abandoned channel. Both reaches were restored, building a new more sinuous channel reconnected to the meadow floodplain. The objective of both projects was to decrease erosion, enhance wetland and riparian habitat and to improve water quality by restoring the stream channel to a geomorphically functioning condition. Restoration of the bed elevation and sinuosity of the stream restored access to the meadow floodplain, raised groundwater elevations, increased sediment deposition and nutrient removal and improved meadow health.

- *Anderson Quarry*. A 17-acre sand-and-gravel quarry was formerly located on the west side of the Upper Truckee within the SP. Most of the viable sand and gravel was excavated from the site prior to State Parks ownership. While the exact dates of use are not known evidence of mining is visible in the 1969 aerial photograph and no mining occurred since State Parks took possession of the property in 1985. In 2003, approximately 80,000 yards of clean fill material taken from the Lower Westside Wetland Restoration Project, along with compost, topsoil, and native seed were used to restore the middle lobe of the quarry. The north and south lobe are still in a similar condition to previous years, both containing brick and asphalt waste. The north lobe has an accidentally created wetland, because the quarry cut intercepts the groundwater from the fen located upslope and water ponds in old divots on the previous quarry floor forming seasonal ponds with riparian vegetation.

Present and Reasonably Foreseeable Projects

Present and reasonably foreseeable, probable future projects are those projects that are currently under construction, approved for construction, or in various stages of formal planning. Some of these projects are planned to be under construction during the period that this project is expected to be constructed (2010–2014).

The present or reasonably foreseeable, probable future projects considered in this cumulative analysis are those projects located within the Upper Truckee River watershed and the South Shore area of the Lake Tahoe Basin and that have been identified as potentially having an effect on resources that also may be affected by the Upper Truckee River Restoration and Golf Course Reconfiguration Project. Table 3.16-2 lists these related projects. A preliminary list of projects was compiled by reviewing available information regarding planned projects (including agency websites), and by contacting the City of South Lake Tahoe, Conservancy, El Dorado County, Lake Valley Fire Protection District, State Parks, TRPA, and USFS staff. Projects were then reviewed for inclusion in the cumulative effects analysis based on three criteria:

- The project is reasonably foreseeable, because it has an identified sponsor, and has initiated CEQA, TRPA, and NEPA environmental review or other regulatory procedures.

- Available information defines the project in sufficient detail to allow meaningful analysis.

- The project could affect resources potentially affected by the Upper Truckee River Restoration and Golf Course Reconfiguration Project.

Identified projects that satisfied these three criteria have been organized into the following three categories:

- river and stream restoration
- water quality and erosion control, and
- other projects.

The projects within each of these categories are described in Table 3.16-2.

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
River and Stream Restoration Projects	
Upper Truckee Middle Reaches 3 and 4 Restoration Project	**Description:** This project proposed and being implemented by the City of South Lake Tahoe with funding from the Conservancy and Reclamation will be located along the Upper Truckee River from roughly 0.5 mile northeast of the northern runway limit of the Lake Tahoe Airport to approximately the midpoint of the runway(Reclamation, City, and TRPA 2008). The objectives of the Upper Truckee Middle Reaches 3 and 4 Restoration Project include restoring natural river and floodplain processes by increasing overbank flow and depositing sediment onto the floodplain, and improving terrestrial and aquatic wildlife habitat. To accomplish these objectives a new channel (approximately 4,000 feet long) will be constructed and revegetated, and in the third year the river's flow will be diverted into the new channel, and the abandoned channel will be backfilled and revegetated. A new floodplain also will be constructed by removing existing fill. Construction of this new channel and floodplain will entail construction of a temporary crossing of the river, removal and stockpiling of approximately 52,000 cubic yards of soil, and also the removal and stockpiling of a large amount of plant materials. Additionally, three fish barriers will be removed and three in-channel habitat structures will be constructed. The total area of disturbance associated with this project will be approximately 28 acres. **Status:** An environmental assessment/finding of no significant impact/initial study/mitigated negative declaration (EA/FONSI/IS/MND) has been prepared for the project and construction began in 2008 and will be completed in 2010 or 2011 (with most in-channel work occurring in less than one season).
Sunset Stables Restoration Project	**Description:** This project proposed by the Conservancy and USFS would be located in a 739-acre Management Planning Area in the vicinity of the South Lake Tahoe Airport, and adjacent to and directly south of the Upper Truckee Middle Reaches 3 and 4 Restoration Project. (ENTRIX 2008). Its goals include restoring a more naturally functioning river and floodplain, improving water quality by restoring floodplain processes, reducing erosion from bank failure, and treating runoff from upstream and adjacent areas. The project will restore, enhance, and protect aquatic and terrestrial habitat diversity and quality and provide for appropriate and compatible public access. To accomplish these goals, it would restore a portion of the 2.6-mile-long reach of the Upper Truckee River that is in the Management Planning Area. This new channel would start east of the U.S. 50 Bridge and would be designed around existing sewer and water pipelines to the extent possible. Lateral grade controls would be installed where the new channel crosses the old channel, and vertical grade controls would be installed where the new channel transitions to existing channel. Implementation would entail excavating new channels, and after the new channels have been revegetated, diverting the river's flow into the new channel(s) and filling and revegetating the abandoned channel. **Status:** Environmental review has begun for the project and an IS/MND and EA/FONSI are being developed. Construction should begin for the first phase in 2011 and last for 3 years. Construction for the second phase would start in 2012 or 2013 and last for 3 years.
Upper Truckee River Middle Reaches 1 and 2 Stream Restoration Project	**Description:** This project proposed by the Conservancy and the Tahoe Resource Conservation District would be located from U.S. 50 upstream to the vicinity of the South Lake Tahoe Airport, and just downstream of the Upper Truckee Middle Reaches 3 and 4 Restoration Project. The objectives of the Upper Truckee Middle Reaches 1 and 2 Stream Restoration Project are to (1) eliminate a gully that is eroding along the river at this site, and (2) enhance aquatic and adjacent terrestrial habitat along the Upper Truckee River. To accomplish these objectives, the gully channel will be filled and revegetated, portions of the channel banks of the Upper Truckee River will be recontoured and revegetated, and some riparian enhancements, bank stabilization, and aquatic habitat structures are also being considered (Carroll, pers. comm., 2007). **Status:** Environmental review has begun for the project and a MND/IS, and EA/FONSI are being developed. Construction could begin in 2011 and would last for 1 season, with only irrigation anticipated in subsequent seasons.

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
Upper Truckee River and Marsh Restoration Project	**Description:** This project proposed by the Conservancy and the Real Estate Services Division would be located along the most downstream reach of the Upper Truckee River from U.S. 50 to where the river connects to Lake Tahoe (EDAW and ENTRIX 2006). Its objectives include restoring natural and self-sustaining river and floodplain processes and functions, protecting, enhancing, and restoring naturally functioning fish and wildlife habitats, improving water quality through enhancement of natural physical and biological processes, protecting and where feasible, expanding Tahoe yellow cress populations, and enhance the quality of public access, access to vistas, and environmental education. To fulfill these objectives, four project alternatives have been developed. These alternatives all include river restoration that would re-establish an active floodplain, create a sinuous channel in the straightened reach, and reduce the input of sediment from eroding banks downstream of the U.S. 50 Bridge. However, the alternatives differ in their approach to this restoration. As a result, features that differ among alternatives include reducing in the size of the river mouth, creating an inset floodplain, narrowing and aggrading the channel, creating a new channel, and re-establishing a river-overflow lagoon. Other features of one or more project alternatives include: constructing a visitor and interpretive center near the end of Venice Drive; isolating the Sailing Lagoon from the marina and reconnecting it to the Upper Truckee River; constructing new trails, boardwalks (or both), or rerouting existing trails; restoring sand ridges at Cover East; and creating a river corridor barrier to reduce disturbance of wildlife by humans. **Status:** Schematic plans and preparation of an EIR/EIS/EIS are in progress. Construction could begin in 2013 and would last for 3 years, and in-channel work could last for approximately 2.5 construction seasons.
High Meadows Forest Plan Designation; Ecosystem Restoration; and Access Travel Management Project	**Description:** This project by the USFS would be located in 1,790 acres in the upper Cold Creek watershed, which is part of the Trout Creek watershed (USFS 2008a). Its purpose includes guiding management of the property, restoring the channel of Cold Creek through the High Meadow Complex to increase water and sediment storage and to allow it to function as a wet meadow ecosystem, and to provide for current and future recreation needs and also reduce the impacts associated with recreation. The project could include creation of approximately 8,700 feet of new channels and associated floodplain on the Mainstem, East Fork, and North Fork of Cold Creek; removal and fill of diversion ditches; removal of lodgepole pines; rerouting and decommissioning of roads and trails, and redesign of stream crossings by roads and trails to reduce effects on aquatic ecosystems. **Status:** The project has completed environmental review and permitting. Construction activities began in 2008 and could continue through 2011 (Heller, pers. comm., 2008).
Erosion Control and Water Quality Projects	
Sierra Tract Erosion Control Project	Description: This project proposed by the City of South Lake Tahoe with funding from the Conservancy and USFS is located in the Sierra Tract Subdivision in the Trout Creek watershed in the City of South Lake Tahoe. It entails construction of a stormwater conveyance and treatment system, and stabilization of roadsides with vegetation. This project has been structured into 5 phases. The project does not include activities in the channel of a perennial waterway. **Status:** Construction of Phase 1 began in 2007 and this phase is still being implemented (USFS 2007). Phase 2 has already been constructed. Phase 3 is being planned and designed and may be constructed in 2011. Planning and design of Phase 4 has begun, with construction expected in 2012 or beyond. Planning and design for phase 5 has not begun and is dependent on funding being available.

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
Al Tahoe Erosion Control Project	**Description:** This project by the City of South Lake Tahoe with funding from the Conservancy and USFS would be implemented in 320 acres of the Al Tahoe neighborhood in the Trout Creek watershed in the City of South Lake Tahoe, adjacent to the project site for the Upper Truckee River and marsh restoration project. Using a variety of measures, the project would treat runoff from the project area with a focus on the area closest to Lake Tahoe (Wood-Rodgers 2007). Treatment measures differ among project alternatives and may include discouraging parking, local revegetation, placement of riprap, curb and gutter, protection of road shoulders with permeable pavement, and other measures in the channel of a perennial waterway (Horvath, pers. comm., 2008). **Status:** Construction of the first area, which discharges directly to the Lake, began in 2009 and should be completed in 2010. Construction of the second area, which also discharges directly to the Lake, is scheduled for 2011. Construction of the phases which drain to the Marsh and river might begin in 2012, if funding is available, and continue for several years.
El Dorado U.S. 50 Segment 2–Lake Tahoe Airport to U.S. 50-SR 89 Junction Water Quality Improvement Project	**Description:** This project by Caltrans (in conjunction with the FHWA) would be located in the watershed of the Upper Truckee River on U.S. 50 from the Lake Tahoe Airport to the junction of U.S. 50 and SR 89 in the City of South Lake Tahoe. It would provide source control, containment, or treatment, or both of stormwater runoff from this segment of U.S. 50 (Caltrans 2007a). Measures could include erosion control measures on eroding slopes; installation of curbs and gutters, sand traps and sand vaults, infiltration basins, bioswales, and maintenance pullouts; and rehabilitating and constructing new drainage inlets and outfalls, and culverts. The project would include some construction activities (e.g., culvert replacement) in the channel of seasonal waterways (and possibly perennial waterways) that are tributaries to the Upper Truckee River. **Status:** An IS/Negative Declaration (ND) has been prepared and construction will begin when funding becomes available.
El Dorado SR 89, Segment 1–Luther Pass to Meyers Water Quality Improvement Project	**Description:** This project by Caltrans (in conjunction with the FHWA) would be located on SR 89 from Luther Pass to the intersection with U.S. 50 in Meyers. It would provide containment, or treatment, or both of stormwater runoff from this segment of SR 89. Measures could include erosion control measures on eroding slopes; installation of curbs and gutters, sand traps and sand vaults, infiltration basins, bioswales, and maintenance pullouts; and rehabilitating and constructing new drainage inlets and outfalls, and culverts. The project would involve replacement of culverts within the channel of Big Meadow Creek, Grass Lake Creek, and unnamed tributaries of the Upper Truckee River (Caltrans 2007b). **Status:** An IS/ND (Caltrans 2007b) has been prepared and construction of this project began in 2009 and could continue until 2014 (McNamara, pers. comm., 2007).
Montgomery Estates Phases 1, 2, and 3 Water Quality Project	**Description:** This project proposed by El Dorado County with funding from the Conservancy and USFS would be located in the watershed of Trout Creek in the City of South Lake Tahoe. It would implement various slope stabilization, infiltration, sediment trapping, and channel or road source treatment best management practices (BMPs) to reduce the amount of sediment discharging into Cold or Trout Creeks. **Status:** Project alternatives are being formulated and evaluated. Construction of Phase 1 could begin in 2010. At least two more years of construction will be required for Phases 2 and 3, but these phases are on hold and thus their construction may not immediately follow Phase 1.
Cold Creek Fisheries Project	**Description:** This project by El Dorado County and the Conservancy would be located at and upstream from the intersection of Pioneer Trail with Cold Creek, which is in the watershed of Trout Creek. Within this area, the project would remove or improve all man-made fish barriers, and evaluate and if necessary remove debris jams and beaver dams. **Status:** Construction could begin in 2010 or 2011 and is anticipated to be completed in 1 season.

Table 3.16-2
List of Related Projects in the
Upper Truckee River Watershed and the South Shore Area

Name	Description and Status
Apalachee 3B – Water Quality Project	**Description:** This project by the Conservancy, El Dorado County, TRPA, and USFS would be located in El Dorado County in the Tahoe Paradise Addition Units 4 and 5 off of Pioneer Trail in the Upper Truckee River and Trout Creek watersheds. It would increase retention and infiltration of runoff from impervious surfaces during large storm events. It also would stabilize eroding cut slopes and roadside drainage ditches, and treat runoff before it discharges into Trout Creek and the Upper Truckee River. The project would not involve activities within stream channels (Ferry, pers. comm., 2007). **Status:** The project has gone out to bid. The last phase of construction could begin in 2010.
Angora Fisheries and Water Quality Project	**Description:** This project by the Conservancy, El Dorado County, and Reclamation would be located in the watershed of the Upper Truckee River at the Angora Creek crossing of Lake Tahoe Boulevard (El Dorado County DOT 2006). It would modify Angora Creek in the vicinity of the culverts under Lake Tahoe Boulevard to improve fish passage. As part of these modifications, fill would be removed in the Stream Environment Zone (SEZ) and the existing culverts would be replaced. Angora Creek would be dewatered and isolated while the culverts were replaced. Some project activities would be in the channel of Angora Creek (e.g., installation of bridge footings). **Status:** The project has undergone environmental review and construction could begin in 2010 and is anticipated to be completed in 1 season (Ferry, pers. comm., 2007).
Christmas Valley Phase 2 Water Quality and Recreation Access	**Description:** This project by El Dorado County with funding from the Conservancy and USFS would be located in the watershed of the Upper Truckee River along SR 89 from the intersection with U.S. 50 to Portal Drive. It would provide a bike trail, and reduce both peak discharge of stormwater during large storm events and the quantity of fine and coarse sediment entering the Upper Truckee River from the project area. This project by the Conservancy, El Dorado County, TRPA, and USFS would be located in the watershed of the Upper Truckee River along Highway 89 from the intersection with U.S. 50 to Portal Drive (Ferry, pers. comm., 2007). It would provide a bike trail, and reduce both peak discharge of stormwater during large storm events and the quantity of fine and coarse sediment entering the Upper Truckee River from the project area. The project would not involve activities in the channel of a perennial waterway. **Status:** Environmental review has been completed. Construction of water quality improvements began in 2009 and could be completed in 2011. Design and construction of the bike trail is still under consideration.
Sawmill 2 Bike Path and Erosion Control Project	**Description:** This project by El Dorado County with funding from the Conservancy and USFS would be located in the watershed of the Upper Truckee River along Sawmill Road from Lake Tahoe Boulevard to U.S. 50 (Ferry, pers. comm., 2007). It would provide a bike trail through the project area, and it would install appropriate BMPs to reduce erosion and nutrient loading, and to increase treatment of stormwater runoff from existing impervious surfaces in the project area. This project would include construction activities in the channel of perennial waterways (e.g., bridge footings and abutments), which would be dewatered during construction. **Status:** Project planning has begun and construction could begin in 2011, and is anticipated to continue for 1–2 years (Ferry, pers. comm., 2007).

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
Other Projects	
Greenway Bike Trail Project	**Description:** This project by the Conservancy would be located between the intersection of Pioneer Trail and U.S. 50 in Meyers, California and Van Sickle State Park at Stateline, Nevada. A portion of this project site is in the watershed of the Upper Truckee River and a portion is in the Trout Creek Watershed. Several alternative routes and two design alternatives have been developed. This project by the Conservancy would be located between the intersection of Pioneer Trail and U.S. 50 in Meyers, California and Van Sickle State Park at Stateline, Nevada. This project site is in the Upper Truckee River, Trout Creek, and other watersheds. The Greenway Bike Trail would be an approximately 9.6-mile-long shared-use trail that would link Meyers, California and Stateline, Nevada (USFS 2008b, TRPA 2008a). The project would also include restoration actions and fuel reduction actions along the trail route. Several alternative routes and two design alternatives have been developed. The project would cross waterways on bridges or raised platforms, and the construction of these crossings would require some in-channel construction activities. **Status:** A draft EIR/EIS/EIS will be released in 2010. Depending on funding availability, construction could begin in 2012 and will proceed in phases over many years.
Lake Tahoe Boulevard Enhancement Project	**Description:** This project by the Conservancy, El Dorado County, and TRPA would be located in the watershed of the Upper Truckee River in a corridor along Lake Tahoe Boulevard from Tahoe Mountain Road to the City of South Lake Tahoe. It would reduce Lake Tahoe Boulevard from 4 to 2 lanes, and along the road it would construct a 2-mile-long bike trail along the road, restore 4 acres of stream environment zone, and implement erosion control measures. This project by the Conservancy, El Dorado County, and TRPA would be located in the watershed of the Upper Truckee River in a corridor along Lake Tahoe Boulevard from Tahoe Mountain Road to the City of South Lake Tahoe (El Dorado County DOT 2007a, 2007b, 2007c). It would reduce Lake Tahoe Boulevard from 4 to 2 lanes, and along the road it would construct a 2-mile-long bike trail along the road, restore 4 acres of stream environment zone, and implement erosion control measures. The project would not involve construction activities in the channel of a perennial waterway. **Status:** Environmental field studies have begun for the project. Construction could begin in 2012 and could continue for 2 years.
Lake Tahoe Airport Runway Restoration Project	**Description:** This project by the City of South Lake Tahoe would be located at the South Lake Tahoe Airport adjacent to the Upper Truckee River. Along the existing runway, it would remove a 25-foot wide by 1,300-foot long area of impervious surface and replace a portion of this area with pervious concrete, and from the remainder of this area, it would remove fill from within the SEZ of the Upper Truckee River and revegetate the area (TRPA 2008b). The project would not involve activities within the channel of the Upper Truckee River or any perennial tributaries of the river. **Status:** Environmental review and permitting are complete. Construction would be completed in 2010.
Sawmill 1B Bike Trail Project – Air Quality and Recreation Access	**Description:** This project by El Dorado County with funding from the Conservancy and TRPA is located along U.S. 50 from the entrance to the Lake Tahoe Golf Course to Sawmill Road (Ferry, pers. comm., 2007). It provides a bike trail across the project area. This project would involve some construction activities in the channel of waterways (e.g., footings and abutments of crossings). **Status:** An IS/MND was completed and approved by the El Dorado County Board of Supervisors in 2005 (Stantec Consulting 2006). Construction was completed in 2009 with only warranty work to continue in 2010.

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
Riparian Hardwoods Restoration and Enhancement	**Description:** This project by State Parks is being implemented in selected areas of SP properties including Washoe Meadows and Lake Valley SRA. It involves the removal of lodgepole pines from areas of aspen, willow and alder along the maintenance road adjacent to the Upper Truckee River upstream of the golf course (State Parks and Reclamation 2007). The project would not involve construction activities in the channel of a perennial waterway. **Status:** A mitigated negative declaration exists for the project. Construction began in 2008 and could continue into 2010.
Multi-Agency Fuel Reduction Plan	**Description:** This plan is a multi-agency strategy for coordinating implementation of fuel reduction treatments in the Lake Tahoe Basin (USFS et al. 2007). Treatment types (i.e., general prescriptions) include community defensible space-wildland urban interface, urban core, defense zone, and general forest prescriptions. All of these prescriptions reduce surface and ladder fuels, and tree density, to reduce flame lengths and the likelihood of crown fire. Treatment methodologies include thinning, pruning, prescribed burning, and masticating and chipping. The strategy identifies a substantial portion of the Upper Truckee River watershed as priority areas for treatment These treatments would not involve construction activities in the channel of perennial waterways. **Status:** Fuel reduction treatments are on-going and the plan identifies priority areas for treatment during the next 5 and 10 years (i.e., 2008–2012 and 2013–2018, respectively).
Heavenly Mountain Resort Master Plan	**Description:** This plan by Vail Resorts, Inc. guides improvement, expansion, and management of facilities and uses at Heavenly Mountain Resort, including areas within the Cold Creek watershed (which is within the Trout Creek watershed). Phase I projects include: replacing ski lifts and regrading ski trails; constructing a 1,000-seat restaurant, a bridge for skiers, and 152 acres of new ski trails; and other facilities. This plan guides improvement, expansion, and management of facilities and uses at Heavenly Mountain Resort, including areas within the Cold Creek watershed (which is within the Trout Creek watershed) (Vail Resorts 2007). Phase I projects include: restoration of SEZ; replacing ski lifts and regrading ski trails; constructing a 1,000-seat restaurant, a bridge for skiers, and 152 acres of new ski trails; and other facilities. Implementation of this plan would involve construction activities (e.g., installation of trail, road, and pipeline crossings) in the channel of perennial waterways. **Status:** The final EIR/EIS/EIS for the amended version of this plan was approved by TRPA in 2007 (Vail Resorts 2007), and construction of Phase I a project has begun and will continue for the next 2 to 4 years (through 2009–2011).
Angora Fire Restoration and Redevelopment	**Description:** Currently much of the Tahoe Mountain/North Upper Truckee neighborhood is being redeveloped after the Angora Fire in the summer of 2007 destroyed 254 structures. Current rules allow for property owners to pursue the replacement of previously existing development. Provisions allow for landowners to expedite the permitting process and granting fee waivers and allocation requirements. Coverage that was preexisting, including coverage located within SEZs and on steep slopes will be allowed to be redeveloped (El Dorado County Planning Department 2007). Various agencies including the Conservancy, El Dorado County and the USFS have implemented erosion control techniques and provided hazardous tree removal assistance in the area. These agencies are proposing additional restoration activities including channel reconstruction, meadow and wetland complex restoration in the burn area (USFS 2009). **Status**: Angora Fire restoration and redevelopment is on-going. It is expected that additional restoration and redevelopment will continue for the next 5 to 10 years.

Table 3.16-2 List of Related Projects in the Upper Truckee River Watershed and the South Shore Area	
Name	Description and Status
Additional Urban Development	**Description:** This urban development would consist of numerous small residential, commercial, industrial, and infrastructure projects in the project vicinity and elsewhere in the watershed of the Upper Truckee River and south shore of Lake Tahoe. These projects might include some construction activities in the channel of perennial or intermittent waterways (e.g., at road and utility crossings). Based on current land use planning and projected changes in population, additional urban development in the project vicinity, watershed of the Upper Truckee River, and south shore of Lake Tahoe is likely. Based on a review of land cover and general plan land use designations within the watershed (using the CDF 2002, UCD 2004, and California Interagency Watershed Mapping Committee 2004 GIS data layers), approximately 8 percent of the watershed is in natural vegetation within areas zoned for developed land uses, and thus a portion of this natural vegetation could be converted to developed land uses in the foreseeable future. The population of the City of South Lake Tahoe is projected to increase 6.4 percent during 2007–2012 (Applied Geographic Solutions 2007), which indicates that some of this additional urban development is likely to occur during implementation of the Upper Truckee River Restoration and Golf Course Reconfiguration Project. This development would consist of numerous small residential, commercial, industrial, and infrastructure projects. These projects might include some construction activities in the channel of perennial or intermittent waterways (e.g., at road and utility crossings). **Status:** Additional urban development is on-going, and anticipated to be on-going throughout implementation of the Upper Truckee River Restoration and Golf Corse Reconfiguration Project.
Source: Data compiled by EDAW (now AECOM) in 2010.	

3.16.3 CUMULATIVE IMPACT ANALYSIS

IMPACT 3.16-1 (All Alts.)

Cumulative Land Use — Potential to Physically Divide an Established Community or Conflict with Land Use Plans, Policies, and Regulations. *None of the alternatives or other reasonably foreseeable projects would involve physically dividing an established community, and implementing Alternative 1, 2, or 4 would not reduce access through the study area. Implementing Alternative 3 or 5 would reduce access through the study area; however, access in unauthorized outside of golf use. In addition, none of the alternatives would conflict with any land use plans, policies, or regulations, and no other reasonably foreseeable projects would conflict with land use plans, policies, or regulations relevant to the study area. Thus, when viewed in connection with other projects, none of the project alternatives would make a considerable contribution to effects on land use plans, policies, or regulations applicable to the study area, and would not physically divide a community. The project's contribution to this cumulative impact would be less than significant.*

As described in Section 3.2, "Land Use," the study area is public land, and none of the alternatives involve dividing an established community. Implementing Alternative 1, 2, or 4 would not reduce access through the study area, and although implementing Alternative 3 or 5 would permanently remove existing golf course bridges on the Upper Truckee River and Angora Creek, these bridges do not provide authorized public access through the study area, outside of golf use. Alternative 2 would include construction of a new bridge that would provide authorized access over the Upper Truckee River. The new bridge proposed under Alternative 4 would not provide public access because the existing design of the course would still have safety hazards when crossing the Upper Truckee. Alternatives 2 and 3 would also provide public access on proposed designated trails that would connect to the Sawmill Bike Trail, Country Club Drive, and other trails within the study area. Other projects that reduce access to public lands could result in a cumulative impact on land use in the project vicinity; however, other past, present, and future projects in the project vicinity could also increase access to public lands by providing new trails (e.g., Sawmill Bike Trail and Greenway Bike Trail). Because none of the alternatives would reduce authorized access or divide a community, the project's contribution to this cumulative impact would be less than significant.

In addition, none of the alternatives would conflict with any plans, policies, or regulations intended to protect the environment. Land uses under all alternatives would be consistent with allowable uses for PAS 119 and the goals and policies in the TRPA *Regional Plan*. None of the alternatives would intensify or expand any nonconforming uses. Implementing any of Alternatives 2–5 would involve a SRA General Plan amendment as part of the proposed action, and implementing Alternative 2, 3, or 5 would involve boundary changes between Lake Valley SRA and Washoe Meadows SP as part of the proposed action. A General Plan amendment would require approval by the State Parks and Recreation Commission, including a finding that these actions are consistent with the Public Resources Code. Amending the existing General Plan and adjusting the park boundaries, as necessary, would ensure that all alternatives are consistent with State Parks plans, policies, and regulations.

Because none of the alternatives would involve dividing an established community or reducing authorized access through the study area, and none of the alternatives would conflict with any plans, policies, or regulations, they would not make a cumulatively considerable contribution to a cumulative land use impact. Therefore, the project's contribution to this cumulative impact would be less than significant.

No additional mitigation is required.

IMPACT 3.16-2 (All Alts.)	**Cumulative Hydrology and Flooding – Long-Term Increased Stormwater Runoff Volumes and Long-Term Increased Peak Flows Generated or Released Downstream**. *Project-generated changes to impervious surface areas or modifications to existing channels of the creeks, drainages, or the Upper Truckee River in the study area would be localized and have stormwater runoff volume effects that are either beneficial (Alternatives 3 and 5), or that could be controlled on-site with mitigation features planned as part of the alternative development (Alternatives 2 and 4). The stormwater runoff volume and peak flow effects could combine with other potential changes to stormwater runoff generation or floodplain attenuation in the vicinity but would not be considerable on their own, or significant in combination. The project's contribution to this cumulative impact would be* ***less than significant****.*

Implementing the No Project/No Action Alternative (Alternative 1) would not increase stormwater runoff volumes or directly modify the peak flows generated in the study area. Therefore, the No Project/No Action alternative (Alternative 1) in would not result in a considerable contribution to a cumulative impact on stormwater runoff and peak flows in the project vicinity.

Implementing any of the action alternatives (Alternatives 2–5) would not adversely affect the altered existing stormwater generation in the study area. Implementing Alternative 3 or 5 would result in net reduction of impervious surfaces and restore natural soil and vegetation conditions to improve stormwater management. Implementing Alternative 2 would modify the patterns of stormwater runoff within the study area, to make improvements in some areas and incorporate on-site stormwater controls for areas with increased runoff through mitigation planned as part of the alternative (Measure 3.3-1 [Alternative 2]). Alternative 4 would make minor modifications to existing stormwater conditions due to bridge replacement, a new restroom and paving of the overflow parking area and incorporate on-site stormwater controls for areas with increased runoff through mitigation planned as part of the alternative (Measure 3.3-1 [Alternative 4]).The planned controls under Alternatives 2 and 4 would include providing on-site storm drainage facilities approved by El Dorado County and TRPA that will identify the location, size, and type of facilities used to retain and treat the runoff volumes and peak flows to meet or surpass preproject conditions. The stormwater designs shall strive to incorporate BMPs such as pervious pavement or pavers, bioswales and vegetated swales, constructed wetlands and detention ponds, rock-lined areas to prevent disruption or erosion, and training of maintenance personnel on stormwater pollution prevention measures.

Implementing Alternative 2, 3, or 5 would increase opportunities for overbanking of flows and enlarge the active floodplain area, potentially modifying (decreasing) peak flows released downstream. Other proposed projects include a range of projects that have individually varied effects on stormwater runoff and peak flows. Some projects may potentially increase runoff from increased impervious surfaces (e.g., bike trails, development projects) or reduced vegetation cover (e.g., fuel reduction projects); others may potentially decrease runoff from decreased impervious surfaces, restore natural soil and vegetation properties that better infiltrate runoff, and/or provide opportunities for detention and infiltration (e.g., Lake Tahoe Boulevard Enhancement, Lake Tahoe Airport Runway Restoration). Proposed projects that would increase impervious surfaces would be required to incorporate mitigation to limit their incremental contribution. These actions would be similar to or beneficial relative to existing conditions and the No Action/No Project Alternative. Changes to stormwater volume and peak flow generation within the study area might combine with other stormwater modifications in the vicinity, because hydrologic effects within the local subwatersheds naturally combine downstream, but the changes would be of small magnitude and difficult to discern. Therefore, implementing any of the action alternatives would not make a considerable contribute to a potentially significant cumulative effect on stormwater runoff volumes or peak flows generated or released downstream and the related projects together would not combine for a significant cumulative effect.

No additional mitigation is required.

IMPACT 3.16-3 (All Alts.) **Cumulative Hydrology and Flooding – Long-Term Increased Overbanking During Small to Moderate Flood Events.** *Project-generated changes to the size and configuration of the Upper Truckee River channel or floodplain within the study area would produce beneficial increases in overbanking during small to moderate flood events under Alternatives 2, 3, and 5. The overbanking effects would produce a discernable beneficial effect on their own and could combine with other potential improvements in overbanking processes downstream. Implementing Alternative 4 would have overbanking effects similar to existing conditions or possibly worse than the No Project/No Action Alternative. Changes in overbanking under Alternative 4 would not be substantial on their own and would not contribute to other potential changes to overbanking processes downstream. The combined effect of the related projects would be beneficial and the project's contribution would be less than considerable. This cumulative impact would be* ***less than significant****.*

Implementing the No Project/No Action Alternative (Alternative 1) would not directly modify the size or configuration of the Upper Truckee River channel or floodplain within the study area. Natural channel adjustments to prior disturbances may eventually provide some limited opportunity for increased frequency of overbanking onto a small active floodplain inset within the incised channel during small to moderate (1.5-year to 10-year). However, the inset floodplain would remain isolated within the incised channel, between high terrace banks with only minor beneficial changes relative to the existing, degraded floodplain function conditions, and those changes would be realized only after many more years of channel adjustment to past disturbances. Furthermore, golf course infrastructure would continue to be adjacent to the Upper Truckee and protection of that infrastructure would further limit potential channel adjustment and overbanking potential. Other restoration projects would either be neutral or beneficial to overbanking processes. Therefore, implementing the No Project/No Action Alternative would not contribute to a potentially significant cumulative effect on overbanking potential during small to moderate flood events. Implementing Alternative 4 would not directly modify the channel capacity and/or floodplain conditions relative to the present degraded state, but it would prevent continued channel widening and perhaps limit the natural formation of a small inset floodplain between terraces. This could result in overbanking frequency that is ‘not as good as expected conditions under the No Project/No Action Alternative. However, the potential for an inset floodplain to form under the No Project/No Action Alternative could also be restricted by spot treatments and repairs to bank stabilization treatments considered critical for protecting golf course infrastructure.

Implementing Alternative 2, 3, or 5 would decrease the Upper Truckee River channel capacity, increase the length of appropriately sized channel, and enlarge the area inundated by the 2-year return interval flow (e.g., 760 cfs within the study area). These changes would result in substantial improvement to overbanking at specific streamflow magnitudes in the study area. Changes to overbanking frequency within the study area, although measureable and substantial under Alternative 2, 3, or 5, would not have a direct effect on overbanking conditions in other adjacent river reaches because of the intervening hydraulic controls of the U.S. 50 bridge and road fill in the active floodplain. Therefore, the effect of the project would not combine with other reaches to cause a significant cumulative impact. Reasonably foreseeable river restoration projects on the Upper Truckee River have alternatives under consideration that would also decrease channel capacity and increase overbank flooding for small and moderate flood events and that would improve channel and floodplain relationships relative to the existing degraded condition along their respective project reaches. Substantial benefits could result, although it is uncertain whether possible adverse influences of climate change under the No Project/No Action Alternative (Alternative 1) would be fully offset by the alternatives. Direct benefits to overbanking would be largely limited to each project area because return flows back from the floodplain to the channel would occur, particularly where road fill and/or bridges limit downvalley floodplain continuity. However, it is possible that project reaches not separated by existing bridges (e.g., U.S. 50/Lake Tahoe Boulevard, U.S. 50 at Elks Club) may experience benefits of improved floodplain connectivity between adjacent project reaches. The benefits within the study area that would result from implementing Alternative 2, 3, or 5 would combine with benefits of other proposed projects downstream, but changes in the study area would not directly enhance overbanking and active floodplain downstream because of the existing U.S 50 crossing roadfill. Therefore, implementing the Alternatives 2, 3, or 5 would not combine with other projects to cause a potentially significant cumulative effect on increased overbanking during small to moderate flood events. This cumulative effect would be less than significant.

No additional mitigation is required.

IMPACT 3.16-4 (All Alts.)	Cumulative Hydrology and Flooding – Long-Term Increased 100-Year Flood Hazard Area or Elevation. *Project-generated changes to the existing channel (size, shape, or location) or the floodplain topographic surfaces and configurations within the FEMA regulatory floodway or floodplain would not result in a higher 100-year flood water surface elevation or an enlarged 100-year floodplain under Alternative 1 or Alternative 4. Changes to the 100-year flood water surface or floodplain area under Alternative 2, 3, or 5 would be minor, and on-site design features planned for these alternatives would avoid increased flood hazards or potential flood damage. The 100-year flood effects from all alternatives would remain localized in the study area, because the existing U.S. 50 bridge crossing would continue to serve as the control on rates of flow released to downstream reaches during a 100-year flood. Therefore, the project's effect would not combine with downstream reach projects' flooding hazards to cause a cumulative effect. This cumulative impact would be less than significant.*

Implementing any of the alternatives (Alternatives 2–5) would either maintain the existing 100-year floodplain storage and flow routes in the study area (Alternatives 1 or 4) or involve incorporating on-site design features planned as mitigation for the alternative (Measure 3.3-4, Alternative 2, 3, or 5), if needed, to not increase risks from flood hazard in the FEMA floodplain. The design features include hydraulic modeling of the proposed channel configuration at a more detailed design level to identify and incorporate modifications into final design that would prevent an increase flood hazards or potential damage to existing structures, residences, or public infrastructure.

Reasonably foreseeable future restoration projects on the Upper Truckee River would not be expected to result in adverse changes to the 100-year floodplain storage capacity, flow routes, or boundaries. Several projects have alternatives that would remove previously placed fill and/or recontour areas within the existing 100-year floodplain that provide minor incremental improvements to the existing degraded condition. Other proposed alternatives for some projects would be expected to incorporate design features and/or mitigation to remain neutral in terms of potential hazards from the 100-year flood because they are also in mapped FEMA special hazard zones. The effects within some project reaches could be substantial if the existing floodplain is highly confined, but in the study area, and in some downstream reaches, the existing 100-year floodplain is already large and has a high storage volume. The project-generated changes in the study area are not expected to be substantial on their own, and the U.S. 50 bridge crossing constriction would prevent effects within the study area from combining with downstream reaches because it would continue to control the rate of flow released downstream. Some of the downstream reaches between constricting bridges may experience combined effects, but those could not affect changes upstream in the study area. Therefore, implementing any of the action alternatives would not contribute to cumulative effects on 100-year flood hazard area or elevation. Therefore, this cumulative effect would be less than significant.

No additional mitigation is required.

IMPACT 3.16-5 (All Alts.)	Cumulative Hydrology and Flooding – Long-Term Modified Groundwater Levels and Flow Patterns. *Project-generated changes to the size, shape, or location of existing creek and river channels, changes to the size, elevation, or use of existing golf course ponds, and changes to soils or subsurface conditions throughout the study area, as well as increased overbanking and active floodplain area, under Alternatives 2, 3, and 5 would result in beneficial changes to groundwater levels and flows within the study area. Implementing Alternative 1 or 4 would not change the groundwater levels or flow patterns from existing conditions; Alternative 4 would prevent minor degradation that would occur under Alternative 1. The potential benefits of Alternatives 2, 3, or 5 could be substantial and beneficial on their own within the study area and may combine with beneficial effects of similar restoration projects downstream to increase low flow season support of groundwater. Therefore, implementing any of the action alternatives would make a considerable contribution to a* ***cumulative beneficial effect*** *related to long-term modified groundwater levels and flow patterns.*

Implementing Alternative 2, 3, or 5 would enhance the groundwater conditions in the study area relative to both existing conditions and the No Project/No Action Alternative (Alternative 1). Implementing Alternative 1 or 4 would not modify the groundwater conditions in the study area relative to existing conditions. Alternative 4 would not involve improvements to groundwater resources within the study area but may prevent continued channel widening from making the existing degraded conditions worse, resulting in a discernable benefit relative to the No Project/No Action Alternative (Alternative 1). Reasonably foreseeable restoration projects along the Upper Truckee River could improve groundwater levels and flow rates and incrementally improve downvalley groundwater connectivity between adjacent reaches. Restoration project alternatives that raise streambed elevations and expand groundwater storage capacity within the replaced (backfilled) valley floor materials may provide minor incremental benefits to adjacent downstream locations because of improved groundwater levels (at least during low flow season), increased storage volumes, and decreased losses to surface water upstream. Proposed erosion control and water quality improvement projects and other enhancement and restoration projects within the local drainages and upstream watersheds would incorporate some site-specific restoration or enhancement of surface water features. These features may control peak flow hydrology in ways that also improve groundwater recharge potential. To the degree that groundwater recharge is improved in dispersed areas of the groundwater basin, incremental benefits to recharge, total storage, and long-term groundwater support to the stream corridors and the study area may result. The detention of peak flows provided by proposed stormwater treatment facilities may help counteract reduced opportunities for groundwater recharge that would result from climate change effects on rainfall runoff versus snowmelt runoff. The erosion control and water quality improvement projects’ effects on groundwater conditions would be beneficial relative to existing conditions and the No Project/No Action Alternative. The study area’s location upstream of other reasonably foreseeable restoration projects suggests that effects within the study area could combine beneficially with other proposed actions downstream and produce cumulative benefits to groundwater conditions in adjacent downstream reaches. This cumulative effect would be beneficial.

No additional mitigation is required.

Impact 3.16-6 (All Alts.)	Cumulative Geomorphology and Water Quality – Long-Term Stream Channel Erosion. *Project-generated changes to surface water bodies under any of the action alternatives would result in stream channel erosion effects that are generally beneficial throughout most of the study area, while potentially creating localized erosion that would be controlled by mitigation planned as part of the alternatives. The stream channel erosion benefits would be substantial on their own and could combine with other potential reductions of erosion along the Upper Truckee River in downstream restoration reaches and by preventing upstream migration of channel instability. Therefore, the effect would be beneficial on its own and would make a considerable contribution to a* ***cumulative beneficial effect*** *related to long-term stream channel erosion.*

Implementing Alternative 1 would not make direct changes to surface water bodies within the study area. However, natural geomorphic response to historic disturbances and the continuing effects of undersized bridges would cause channel instability that erodes the streambanks and streambed within the study area, releasing sediment and nutrients that degrade the river and lake water quality relative to undisturbed natural conditions.

Implementing any of the action alternatives would reduce stream channel erosion within the study area relative to existing conditions or the No Project/No Action Alternative, resulting in substantial overall benefits. Alternatives 2, 3, and 5 would involve making changes to the channel of the Upper Truckee River, the mouth of Angora Creek, and the mouth of the unnamed creek to offset past geomorphic response to historic disturbances and the undersized bridges within the study area. Alternative 4 would involve making direct changes to the channel of the Upper Truckee River, the mouth of Angora Creek, and the mouth of the unnamed creek to prevent continued geomorphic response to historic disturbances and reduce the effects of undersized bridges within the study area. The potentially significant local erosion impacts of each action alternatives would be controlled through mitigation planned as part of each action alternative (Mitigation Measures 3.4-1A, 3.4-1B, and 3.4-1C for Alternatives 2, 3, 4, and 5). The planned controls include providing channel bed and bank stabilization at the bridge removal sites, ensuring bed and bank stability downstream of the treated reaches, and ensuring bed and bank stability in the lower reaches of both tributary creeks in the study area (Angora Creek and the unnamed creek). The dominant project effect of any action alternative would be beneficial.

Other reasonably foreseeable restoration projects in the watershed would repair, restore, and/or reconstruct portions the Upper Truckee River channel and would be expected to have a beneficial long-term overall effect on stream channel erosion rates, including the expectation that any potential localized increased erosion risks within their study areas or adverse effects on immediate upstream or downstream reaches would be controlled through design and/or implementation of on-site, project-specific mitigation measures. Benefits of these channel modifications would be substantial relative to existing conditions and the No Project/No Action Alternative, but largely limited to each respective project area. Combining benefits between reaches would be expected where project-generated changes in one reach could protect channel stability of adjacent upstream reaches and tributaries.

Reasonably foreseeable erosion control projects in the vicinity would be neutral or beneficial because they would control runoff volumes and regulate peak flows within the contributing subwatersheds. Other proposed projects include a range of projects that have individually varied effects on runoff. Some projects may potentially increase runoff from increased impervious surfaces (e.g., bike trails, development projects) or reduced vegetation cover (e.g., fuel reduction projects); others may potentially decrease runoff from decreased impervious surfaces (e.g., Lake Tahoe Boulevard Enhancement, Lake Tahoe Airport Runway Restoration). Proposed projects that would increase impervious surfaces would be required to incorporate mitigation to limit their incremental contribution. A measureable beneficial effect of smaller erosion control and other projects would be difficult to discern because they focus on controlling runoff for small to moderate events, which are less likely to cause erosion in the main stream channel.

Although the No Project/No Action Alternative would result in continuation of an adverse condition, because it is not a change from existing conditions, this alternative’s contribution to a cumulative impact would be less than considerable. Reductions of stream channel erosion within the study area under the action alternatives would be additive with other stream channel erosion reductions in terms of total benefit along the entire Upper Truckee River, but changes within the study area would not directly improve channel erosion downstream. Because of the location of the study area, improvements in the channel stability would only combine with other actions by preventing channel instability from migrating further upstream. Therefore, implementing any of the action alternatives would be beneficial on its own and would contribute beneficially to cumulative benefits on stream channel erosion from other restoration projects in the watershed. No additional mitigation is required.

IMPACT 3.16-7 (All Alts.)	Cumulative Geomorphology and Water Quality – Long-Term Fine Sediment and Nutrient Retention. *Project-generated changes to the channel capacity and elevation, the frequency of overbanking, or the area of functional active floodplain within the study area would produce beneficial increases in fine sediment and nutrient retention during small to moderate flood events under Alternatives 2, 3, and 5. The fine sediment and nutrient retention effects would produce a discernable beneficial effect on their own and could combine with other potential improvements in floodplain processes downstream to cumulatively reduce sediment and nutrients delivered to Lake Tahoe. Implementing Alternative 4 would have fine sediment and nutrient retention effects similar to existing conditions or possibly worse than the No Project/No Action Alternative. Changes under Alternative 1 or Alternative 4 would not be substantial on their own and would not contribute to other potential changes to fine sediment and nutrient retention downstream. However, implementing Alternative 2, 3, or 5 would make a considerable contribution to a* ***beneficial cumulative effect*** *related to long-term fine sediment and nutrient retention resulting from the combination of restoration projects along the river.*

Implementing Alternative 2, 3, or 5 would decrease the Upper Truckee River channel capacity, increase the length of appropriately sized channel, and enlarge the area inundated by the 2-year return interval flow (e.g., 760 cfs within the study area). These changes would result in a substantial improvement to overbanking at specific streamflow magnitudes in the study area. The area of active floodplain would be enlarged, and the length of channel with overbanking would increase, allowing more opportunities for low-velocity, shallow flooding that deposits fine sediment and supports vegetation uptake of nutrients. Floodplain vegetation would be modified to incorporate increased area, density, and diversity of native vegetation within the overbank zone along the river (increasing the buffer distance for alternatives that retain a golf course and replacing golf course managed landscaping), which would enhance opportunities for flow interception and trapping. Implementing Alternative 1 or 4 would not directly modify the channel capacity and/or floodplain conditions relative to the present degraded state; however Alternative 4 would prevent continued channel widening and perhaps limit the natural formation of a small inset floodplain between terraces that could potentially occur under the No Project/No Action Alternative. This could result in future fine sediment and nutrient trapping that is less than what may eventually occur in a naturally inset floodplain under Alternative 1. Changes to active floodplain processes of sediment and nutrient retention within the study area, although measureable and considerable under Alternative 2, 3, or 5, would not contribute to floodplain process changes in other adjacent river reaches because of the intervening hydraulic controls of the U.S. 50 bridge and road fill in the active floodplain.

Reasonably foreseeable river restoration projects on the Upper Truckee River have alternatives under consideration that would also improve floodplain processes of sediment and nutrient retention for small and moderate flood events, relative to the existing degraded condition along their respective project reaches. Substantial benefits could result, although it is uncertain whether possible adverse influences of climate change under the No Project/No Action Alternative would be fully offset by implementing any of the alternatives. Benefits to floodplain sediment and nutrient retention would be largely confined to each project area because return flows back from the floodplain to the channel would occur between project reaches, particularly where road fill and/or bridges limit downvalley floodplain continuity. However, it is possible that floodplain connectivity between adjacent reaches may be improved between existing bridges. The benefits within the study area that would result from implementing Alternative 2, 3, or 5 would add to benefits of other restoration projects downstream to cumulatively reduce fine sediment and nutrients delivered to Lake Tahoe. Therefore, implementing any of the action alternatives would be beneficial on their own and would contribute to beneficial cumulative effects on fine sediment and nutrient retention during small to moderate flood events. The combined effect of the proposed restoration projects would be beneficial.

No additional mitigation is required.

IMPACT 3.16-8 (All Alts.)	**Cumulative Geomorphology and Water Quality – Long-Term Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream.** *Project-generated changes to the channel bed profile, bank and bed materials, or the hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River could worsen (Alternative 2, 3, or 5) relative to effects of historically declining watershed coarse sediment yield on downstream channel erosion and beach erosion adjacent to the river mouth (i.e., at Cove East and Barton Beach) or remain similar to the No Project/No Action Alternative (Alternative 4). Potential contributions of the project could be considerable and combine with effects of other actions on coarse sediment transport and delivery, but the incremental or combined consequences to channel and beach erosion are not predictable because of highly uncertain climate change influences, especially on beach erosion. Conditions could range from worse than the existing degraded condition to a possible improvement regardless of coarse sediment delivery changes. After thorough investigation, consideration of these conditions remains* ***too speculative for a meaningful significance conclusion****.*

Implementing the No Project/No Action Alternative (Alternative 1) would not involve directly modifying the channel bed profile, bank and bed materials, or hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Implementing any of the action alternatives would result in modifications to the channel bed profile, bank and bed materials, and the hydraulic conditions controlling bedload (i.e., sands and gravel) transport within the study area and into the downstream reaches of the Upper Truckee River. Alternatives 2, 3, and 5 would involve making major modifications to the channel bed profile and would anticipate net sedimentation of coarse sediment to create aggraded portions in the treatment reaches of the study area. This could limit transport from upstream sources through and out of the study area. Implementing Alternative 4 would result in minor modifications to the profile. It would limit bed and bank erosion that could reduce local sources of coarse sediment but would not limit transport from upstream sources. Given the background of naturally declining watershed coarse sediment yield and ongoing channel and beach erosion, adverse changes could worsen the existing degraded condition in downstream reaches or along the shoreline.

Impacts of implementing the project could combine with the potential coarse sediment effects of other reasonably foreseeable future restoration projects downstream on the Upper Truckee River to increase the potential risk of erosion consequences in downstream channel reaches and along the beach. Although the performance goals of the proposed restoration projects would be focused on reducing human-induced excessive erosion, some of the treatment approaches and channel designs might also further reduce the supply of coarse sediment generated by the natural process of streambed or streambank erosion. The projects would not modify coarse sediment sources along the river upstream of Meyers, but they could reduce the downstream delivery of coarse sediment relative to existing conditions, because they create additional opportunities for in-channel and floodplain sedimentation and reduce sediment generated due to bank erosion.

Proposed erosion control and water quality improvement projects within the local drainages and upstream watersheds would involve installing measures designed to detain runoff and capture fine sediment. Although the performance goals would be focused on treating fine sediment, nutrient, and other urban pollutant loads, many of the methods and facilities would inadvertently trap coarse sediment. Coarse sediment captured in stormwater facilities would likely be removed under normal maintenance practices. This could create a minor, but potentially measureable, decrease in coarse sediment delivery to downstream receiving waters.

For the long term, highly uncertain climate change influences might overwhelm the possible long-term effects of any action. It is possible that climate change may exacerbate impacts (e.g., further decrease coarse sediment delivery) or counteract them (e.g., lower lake levels, reducing beach erosion). The net effect of these factors, given the uncertainty associated with climate change, is not yet practical to quantify with current scientific understanding, but they could range from worse than the existing degraded condition to a possible improvement in beach erosion. Given the uncertainty of future climate change-related conditions and the fact that the uncertainties range from exacerbated to improved, consideration of project-specific effects and potential cumulative impacts remains too speculative for a meaningful cumulative significance conclusion.

No additional mitigation is required.

IMPACT 3.16-9 (All Alts.)	Cumulative Geomorphology and Water Quality – Short-Term Risk of Surface Water or Groundwater Degradation during Construction. *Project construction activities would occur along or in the channel of the Upper Truckee River, Angora Creek, and the unnamed creek under the all action alternatives. Although temporary BMPs would be implemented, short-term risk of water quality degradation during construction could occur during summer construction seasons or intervening winters. Short-term turbidity that potentially impairs noncontact recreation beneficial uses (i.e., aesthetics) would be minimized by mitigation features planned as part of the alternatives. The residual impact would be minor under the action alternatives, but could violate water quality standards of the Basin Plan, including the turbidity standard (<10 percent above background). If similar impacts occurred under reasonably foreseeable projects at the same time, the effects could combine downstream to increase the magnitude or duration of the water quality standard violation. Although the joint probability of concurrent failures of BMPs, given the high anticipated performance standards and short overlapping periods of construction, would be extremely remote, if it occurred, the combined effect would be cumulatively significant. The project could result in a considerable contribution to the combined, significant cumulative adverse effects related to violation of a water quality standard. This cumulative impact would be* ***potentially significant.***

The No Project/No Action Alternative (Alternative 1) would not include any planned construction, although it is possible that emergency repairs during or following damaging high flows could be required to reinforce or replace bridges, repair existing streambank stabilization measures, or protect infrastructure (i.e., irrigation pipelines on bridges or buried under or along the river), as would occur under existing conditions. All four action alternatives (Alternatives 2–5) would require active construction upslope of, near, and/or in active stream channels and in the vicinity of other surface water bodies and groundwater recharge areas. Although temporary BMPs would be implemented, short-term risk of water quality degradation during construction could occur. All of the action alternatives would incorporate on-site construction phase management plans through mitigation planned as part of the alternatives (Mitigation Measure 3.4-6). The planned controls include many specific measures to be implemented by State Parks, including restricted disturbance areas and duration; BMPs that are effective up to the 20-year precipitation event and 50-year streamflow event; discrete measures for various subdrainage areas on each side of each water body; construction equipment and vehicle restrictions; specific winterization guidelines; protection for transported and stored materials and debris; custom dewatering/bypassing plans; rewetting requirements; and monitoring of water quality, BMP effectiveness, and remedial action requirements. The controls would limit the likelihood and magnitude of potential short-term water quality degradation that could result in persistent turbidity above background levels and impair beneficial uses. However, the potential for violations of narrative or numerical water quality standards of the Basin Plan, at least for short periods of time, cannot be feasibly eliminated. T A detailed discussion of the significance criteria is provided in Section 3.4, “Geomorphology and Water Quality”. The reasonably foreseeable future stream restoration projects along the Upper Truckee River are in contiguous reaches downstream of the study area, including areas where active construction is currently occurring and could continue through 2015. Exposure to high flows during intervening winters could occur; however, each proposed restoration project is expected to take many measures to reduce the potential risk of short-term water quality degradation, including:

- restricting the area and duration of construction disturbance to the absolute minimum necessary and
- designing, installing, and maintaining temporary BMPs to protect disturbed areas and minimize soil erosion; prevent surface runoff interaction with disturbed surfaces; and limit the potential for release of sediment, nutrient, or otherwise contaminated water into water bodies outside the construction disturbance zone.

The performance standards for overwintering BMPs on the reasonably foreseeable projects would be expected to be the same as those for the mitigation identified for the action alternatives, but it is possible that the BMPs could fail, particularly if unusual runoff or streamflow conditions occur that exceed the BMP design capacity. The Upper Truckee River has no dams or other flow-regulation facilities, and it is not possible to predict weather and runoff conditions before the onset of construction, especially construction that occurs over more than one season. The projects would all be located along the same unregulated river, and all would be scheduled without advanced prediction of future storm events. Therefore, if a storm event created conditions in the watershed that overwhelmed temporary BMPs at one project site, it is conceivable that BMPs for other projects concurrently in active construction also could fail. The exposure would largely be related to sediment from disturbed or re-vegetated surfaces that are present on-site over winter, rather than other type of potential pollutants that would be present during active summer construction seasons. The concurrent exposure to the same impact mechanism produces a potential adverse cumulative impact involving storm damage in one construction reach influencing BMP performance in other, downstream reaches. However, the BMP performance standards would be expected to be relatively high (i.e., 20-year precipitation event, 50-year streamflow event) relative to the short time frame of overlapping construction for multiple project reaches (i.e., likely just days or weeks within the years of active construction). The joint probability of multiple projects having BMPs that concurrently fail would be extremely remote. However, the potential for violations of narrative or numerical water quality standards of the Basin Plan, including the turbidity standard, cannot be feasibly eliminated, although inclusion of BMPs would substantially reduce impacts so not to affect aesthetics or other beneficial uses. Thus, the cumulative risk of violating a water quality standard would be significant and the project's contribution to this cumulative impact would be considerable. This cumulative impact would be potentially significant.

All feasible mitigation has been incorporated into the individual restoration project plans and construction BMPs for specific projects. Additional feasible cumulative impact mitigation is not available and the residual impact would remain cumulatively significant and unavoidable.

IMPACT 3.16-10 (All Alts.)

Cumulative Geomorphology and Water Quality – Short-Term Risk of Surface Water or Groundwater Degradation Following Construction. *Project implementation would include periods of adjustment in channel sections following construction to meet final design (Alternatives 2, 3, and 5), reseeding of native species on active floodplains (Alternatives 2, 3, and 5), and biotechnical streambank treatments (all action alternatives) that could be vulnerable to a large flood within the first few years following construction. Potential reductions in coarse sediment delivery downstream, mobilization of fine sediment and organic matter on reactivated floodplains, and flood damage resulting in persistent or chronic water quality degradation would be controlled by mitigation features planned as part of the alternatives development. The residual impacts would be minor under the action alternatives, but could violate a stringent water quality standard of the Basin Plan (<10 percent above background). If similar impacts occurred at reasonably foreseeable projects during the same interim period, effects could combine downstream to increase the magnitude or duration of the water quality standard violation. This combined effect would be cumulatively significant and the project could result in a considerable contribution to the effect. This cumulative impact would be* ***potentially significant****.*

Implementing Alternative 1 would not require any planned construction, although it is possible that flood damage to existing undersized bridges, public infrastructure, or stream stabilization features that protect infrastructure may need emergency or follow-up repairs, as under existing conditions. If such activities are required to protect infrastructure and/or repair or replace bridges, their areal extent would be localized, and it is likely that the repair measures would rely on hard engineering features that would be 'at design' grade and stable at the time of installation. It is unlikely that post construction geomorphic adjustments would be required to meet final design parameters, and the treatments would cover the entire localized erosion source area. Implementing Alternative 1 would not create a mechanism to increase short-term risk of water quality following construction. Therefore, Alternative 1 would not make a considerable contribution to a cumulatively significant effect. This impact would be less than significant.

Implementation of Alternative 2, 3, or 5 would include periods of geomorphic adjustment for channel sections following construction to meet final design, including net aggradation (e.g., deposition of coarse sediment), bed mobilization to redistribute materials, and local bank erosion to meet geomorphic equilibrium dimensions. These adjustments would most likely occur during and just following peak seasonal streamflows (around or higher than the intended design capacity of 500–550 cfs). Under Alternative 4, the river system would be expected to respond to an unusually large flood within the first few years after construction differently than Alternatives 2, 3, and 5, since Alternative 4 would treat the entire reach between hard grade controls (RS 1400 to RS 8800), would not enlarge or reactivate as floodplain portions of the existing terrace that have remained isolated from flow and have accumulated sediment, and would not modify the alignment or create backfilled channels that could be vulnerable to recapture. These differences reduce the potential likelihood and magnitude of effects from a large flood event relative to existing conditions. While the residual effects of an unusually large flood within the first few years of construction would be no worse than under the existing conditions and the No Project/No Action Alternative, a potential for narrative or numeric water quality standards to be violated would exist. The probability that project-related turbidity impacts would be substantially greater than under the existing flows (and the No Project/No Action Alternative) and/or that they would impair beneficial uses outside the treatment reaches would be low the potential for violations of the Basin Plan turbidity standard, at least for short periods of time, cannot be feasibly eliminated. A detailed discussion of the significance criteria is provided in Section 3.4, "Geomorphology and Water Quality", Potential reductions in coarse sediment delivery and downstream effects on channel or beach erosion would be controlled by mitigation planned as part of alternatives development (Mitigation Measure 3.4-5). The planned controls would require State Parks to monitor for excessive bedload deposition within the study area and for substantial reductions in coarse sediment discharged at the downstream end of the study area; perform a joint assessment of possible downstream effects in coordination with downstream landowners; and, as needed, supplement coarse sediment supply downstream.

Implementation of Alternative 2, 3, or 5 would include reseeding large areas of former golf course floodplain with native species and activating floodplain areas that have been dormant and collecting sediment and organic matter. All of the action alternatives would involve installing biotechnical streambank protections that might not achieve maximum hydraulic resistance or geotechnical strength within 5 years of construction as vegetation fills in and matures. If a large flood (i.e., 25-year recurrence or larger) occurs within the first few years of construction, it could produce erosion and sedimentation in the modified channels and/or floodplain that degrades water quality, at least for short periods (potentially hours, days, or, most likely, weeks). Although the same flood event could also result in potential water quality degradation under the No Project/No Action Alternative, the project activities may alter the location, extent, and duration of impacts. For example, the existing floodplain occupied by golf course currently has erosion-resistant turf, whereas some of the active channel and floodplain under Alternative 2, 3, or 5 would involve construction disturbance in areas that have not been active for decades. Fine sediment and organic matter mobilization in newly reactivated floodplain areas would be minimized by mitigation planned as part of Alternatives 2, 3, and 5 (Mitigation Measure 3.4-7A) that involves removing loose, unvegetated, or otherwise unstable fine sediment and/or organic material and revegetating loose, unvegetated, or otherwise unstable fine sediment within remnant channel sections. Possible channel and floodplain damage that could result in persistent or chronic water quality degradation within the study area would be controlled by mitigation planned as part of all action alternatives (Mitigation Measure 3.4-7B) that requires State Parks to develop and implement an adaptive management plan with specific data collection and monitoring protocols, decision-making processes and authorities, and thresholds for corrective actions. The residual impacts of the action alternatives would not be substantial on their own as they relate to degradation of beneficial uses, but the potential for violations of the narrative or numerical turbidity standard in the Basin Plan (<10 percent above background) cannot be feasibly eliminated.

The reasonably foreseeable stream restoration projects on the Upper Truckee River are in contiguous reaches downstream of the study area. Although each proposed restoration project is expected to take measures to reduce potential effects during construction, the specific details of post-construction mitigation measures for each project cannot be determined until detailed design development occurs. Some of the alternatives for various reaches include the need for post-construction natural channel adjustments, and all the projects likely include channel, bank, or floodplain treatments that may not reach full erosion resistance within the first couple of years. The projects would be located along the same unregulated river, and if a large flood occurred within the first few years of construction, it could affect multiple project reaches, combining to increase the potential magnitude or duration of water quality violation effect and/or causing a channel response that eventually affects more than one reach. During an interim period of 5 years following construction, the probability of a large flood (e.g., 25-year recurrence or larger) is relatively high, because it would be the additive probability of the same statistical chance for each project (i.e., 20 percent over the interim period of 5 years). Therefore, such an event could be reasonably expected. Overall, the potential for water quality degradation during such an event would likely be less under one of the action alternatives than under the No Project/No Action Alternative, primarily because the bank heights would be lowered and the channel slopes would be reduced compared with the existing degraded condition of the channel. Furthermore, a large flood event would have naturally high background turbidity levels. Nevertheless, locally worse conditions and/or flood damage could result under one of the action alternatives and in combination with other reasonably foreseeable restoration projects. The combined risk of increased turbidity from multiple restoration projects in their post-construction maturation period together would be cumulatively significant. Violations of the Basin Plan turbidity standard could occur, even if the resulting conditions were not severe enough to negatively affect beneficial uses. A large flood effect would most likely occur during winter storms, including rain-on-snow events when absorption rates are low and runoff rates are high. During these large events, background turbidity tends to be extremely high, and aesthetic beneficial uses are less prevalent. Implementation of Alternatives 2, 3, and 5 and to a lesser extent Alternative 4 could make a considerable contribution to a potentially significant cumulative impact. This impact would be a potentially significant cumulative effect.

Mitigation Measure 3.16-10A: Cumulative Geomorphology and Water Quality – Implement Alternative-Specific Measures to Minimize or Correct Temporary Water Quality Effects Following Construction.

The nature of this mitigation measure would vary by project site/reach and by alternative selected, and each project lead agency/sponsor shall develop and implement these measures separately during detailed design development. The measures would be alternative and site specific and designed to minimize or correct potential water quality effects from a large flood (25-year recurrence or larger) within 5 years of construction. The performance criterion for the mitigation will be to minimize the risk of significant water quality impact(s) during the 5 year period following completion of construction. For example, some of the proposed alternatives shall include longer revegetation/stabilization periods before reactivation of channel sections, other alternatives shall include preproject removal of accumulated fines and organic matter in reactivated floodplains/channels, and some shall involve monitoring and the potential replenishment of coarse sediment to downstream reaches.

Mitigation Measure 3.16-10B: Cumulative Geomorphology and Water Quality – Implement an Interim Adaptive Management Plan on the Upper Truckee River.

The project proponents for all the restoration project reaches on the Upper Truckee River (i.e., California Tahoe Conservancy, State Parks, United States Forest Service, and the City of South Lake Tahoe) currently participate in the Upper Truckee River Watershed Advisory Group (UTRWAG), which is a forum to facilitate discussion of issues important to the planning, implementation, and monitoring of SEZ and river improvement, enhancement, and restoration projects in the watershed. The aforementioned agencies also participate in a subcommittee of the UTRWAG that focuses on coordinated adaptive management (activities necessary for resource management of the various UTR improvement projects). These activities include:

- sharing and evaluating monitoring data
- determining effectiveness of implementation and monitoring
- identifying potential problems and sources
- making suggestions and providing mutual feedback regarding potential activities or actions in response to resource degradation or revisions to objectives or monitoring in the various Upper Truckee River project areas

The project proponents shall continue adaptive management with a plan focused on preventing potential short-term water quality degradation that may result if unexpectedly large flood flows occur within the first 5 years after construction of each project. Each project reach will collect and evaluate monitoring data for its reach. The UTRWAG subcomittee will coordinate annual data review and field inspections for each project reach during the period of adjustment and initial flood vulnerability and will develop recommendations for an adaptive management action. Potential actions could include changes to objectives or monitoring, minor maintenance, (e.g., additional re-vegetation or spot repairs) or intervention such as corrective action to ameliorate a chronic or worsening trend and continued monitoring to determine if there is need for future action. The adaptive management subcommittee will focus on identifying potential problems, and guiding levels of monitoring or action to prevent them from becoming a persistent, recurring, or chronic source. The coordinated effort will foster early identification of short-term surface water quality degradation and will aid in the facilitation of remedial actions Adaptive management shall be in force for the interim period of channel adjustment and initial flood vulnerability (i.e., at least 5 years but no more than 10 years from the end of construction—sufficient length to allow for expected natural channel adjustments).

With implementation of Mitigation Measures 3.16-10A and 3.16-10B as described above, the likelihood and potential magnitude and duration of Impact 3.16-10 would be lessened, and would not be considerably worse than under existing conditions or the No Project/No Action Alternative. However, the cumulative risk of Basin Plan turbidity standard violations cannot be feasibly eliminated and the residual effect would remain significant and unavoidable.

IMPACT 3.16-11 (All Alts.)

Cumulative Biological Resources – Short-Term Effects on Fisheries and Aquatic Resources. *Project construction activities along or in the channel of the Upper Truckee River, Angora Creek, or the unnamed creek could result in temporary adverse effects on water quality, aquatic habitats, and the aquatic community under the action alternatives. Project implementation would also cause channel sections or features to undergo periods of adjustment after construction, making project features vulnerable to habitat degradation as a result of a large flood occurring within the first few years after construction. These short-term effects would be minimized by mitigation features planned as part of alternatives development. The residual effects of the action alternatives would be minor, but if similar effects were to occur as a result of reasonably foreseeable projects during the same interim period, the effects could combine downstream to increase the magnitude or severity of an adverse effect on water quality, aquatic habitat, and/or the aquatic community. The combined risk of such an event would be cumulatively significant and the project's contribution could be considerable. This cumulative impact would be* ***potentially significant****.*

The size and configuration of stream channels or associated aquatic habitats in the study area would not be physically modified under Alternative 1. However, aquatic habitat functions and values for fish and other aquatic organisms would continue to be influenced by trends in natural geomorphic processes caused by the current encroachments on the stream corridor. Channelization, incision, and resulting channel widening (in response to incision) of the Upper Truckee River channel would continue to occur throughout the project reach.

It is anticipated that treatments would be applied to eroding banks periodically to prevent the loss of areas managed as golf course and to maintain the stability of structures (e.g., bridges), or bridges may be replaced, if needed. However, the potential for application of these treatments would be the same as under current conditions. The nature and extent of these unforeseeable activities are unknown and would not be a direct result of implementing Alternative 1. In the short term the simplified condition of aquatic habitats would remain similar to the existing degraded condition. Alternative 1 would not result in cumulative effects from project-related rescue and relocation in the Upper Truckee River. Under this alternative, the stream channel would not be disturbed so there would be no disturbance to habitat and no reason to rescue and relocate fish from this reach of the Upper Truckee River. Therefore, Alternative 1 would not make a considerable contribution to a cumulatively significant effect. This impact would be less than significant.

Project construction activities related to action alternatives could result in increased turbidity and downstream sedimentation and could result in the release and exposure of construction-related contaminants. Such exposure could reduce or adversely affect aquatic habitat and populations, including native species. All of the action alternatives would involve construction activities that would disturb instream sediments and soils adjacent to waterways. With project implementation, channel sections could undergo periods of channel adjustment after construction to meet final design objectives (Alternatives 2, 3, and 5), areas of reseeded native species would be located on active floodplains (Alternatives 2, 3, and 5), and biotechnical streambank treatments would occur (all action alternatives). These project features could be vulnerable to habitat degradation as a result of a large flood within the first few years following construction.

Water Quality: Sedimentation and Turbidity, Release and Exposure of Contaminants

Construction activities under all of the action alternatives would disturb instream sediments and soils adjacent to waterways. Any resulting erosion or disturbance of instream sediments and soils would temporarily increase turbidity and sedimentation downstream of the construction sites throughout the study area if soils were transported in the river flows or stormwater runoff. The potential also exists for contaminants used in construction activities to be accidentally introduced into the water system, either directly in spills or incrementally through surface runoff, from work within or immediately adjacent to the channel. Several measures would be implemented as part of the project to minimize potential effects on water quality. Further, all of the action alternatives would incorporate on-site construction-phase management plans through mitigation planned as part of the alternatives (Measure 3.5-1A). The controls would limit the likelihood and magnitude of potential short-term water quality degradation that could also degrade aquatic habitat.

Direct Disturbance and Temporary Loss of Habitat during Construction Activities

Several aspects of construction under each of the action alternatives would require dewatering of the active channel to allow for access. These activities would occur during the low-flow summer months. The native fish and macroinvertebrate species occupying aquatic habitats could be injured or killed directly or indirectly by heavy equipment during site access, preparation, or construction activities, if present in the affected area. Project construction activities would also result in the temporary loss of riparian trees and shrubs that provide important shaded riverine aquatic habitat functions, including shade, cover, complexity, and substrate for macroinvertebrates.

All of the action alternatives would incorporate preconstruction surveys and native-fish and mussel translocation plans through mitigation planned as part of the alternatives (Measures 3.5-1B and 3.5-1C). The controls would limit the potential for native fish and macroinvertebrate species to be injured or killed. The action alternatives (Alternatives 2–5) would result in channel improvements that would disrupt aquatic habitat, dewater channel reaches and result in the rescue and relocation of fish in the Upper Truckee River. However, because fish are highly motile, they would redistribute themselves throughout the river segments once restoration work is completed and stream flow is restored. There would be no long-term cumulative population-level impacts to introduced trout or native fish populations, and therefore, no cumulatively significant effect from the action alternatives.

Fish and mussel rescue and relocation for several proposed restoration actions may occur sequentially or concurrently during summer construction periods from 2010 to 2015 and individual fish and mussel relocations will need some level of coordination to avoid releasing too many rescued fish and mussels into one area of the Upper Truckee River. Some mortality would occur as a result of capture and handling but this would be minor relative to the number rescued and would not result in population-level effects. Multiple concurrent rescue and relocation efforts would lead to a short-term change in the distribution of fish and mussels within the Upper Truckee River. Fish are highly motile and would quickly re-colonize restored habitats. Following the completion of proposed future restoration actions, the fish community would gradually return to a more natural condition with all species present relative to existing conditions. Therefore, no population-level, cumulative impact would occur and the proposed project would not contribute to a cumulatively significant effect. This impact would be less than significant.

Initial Channel Response

After the completion of construction activities, some habitat improvements associated with river ecosystem restoration activities would be realized immediately. However, the new physical form of the channel and associated floodplain would also result in immediate changes to hydraulic conditions, which in turn would result in a geomorphic response for some period of time until a new dynamic equilibrium was reached. Depending on the specific, localized circumstances, localized changes in water velocities and sediment transport and depositional patterns could occur. Because the geomorphic response is process driven and subject to several highly variable conditions (e.g., frequency, duration, and magnitude of intermediate- to high-flow events; local sediment grain sizes; local channel geometry), it can be extremely difficult to predict the nature and extent of short-term (interim) outcomes. Nevertheless, as described for all action alternatives it is possible that some aquatic habitat conditions could become temporarily degraded during the channel's initial response to the changed physical condition.

All of the action alternatives would incorporate activities to stabilize the channel during and immediately after construction through mitigation planned as part of the alternatives (Measures 3.5-1D and 3.5-1H). The controls would limit the potential for adverse effects on habitat conditions within the study area, and the residual effects of the action alternatives would not be substantial on their own.

All of the action alternatives would incorporate measures to limit the likelihood and magnitude of potential short-term water quality degradation, limit the potential for native fish and macroinvertebrate species to be injured or killed, and stabilize the channel during and immediately after construction, through mitigation planned as part of the alternatives (Measures 3.16-11A and 3.16-11H). These measures would limit the potential for adverse effects on habitat conditions within the study area, and the residual effects of the action alternatives would not be substantial on their own.

Active construction could occur during multiple years for the reasonably foreseeable future stream restoration projects downstream along the Upper Truckee River. Each proposed restoration project is expected to take similar measures to reduce the potential effects on aquatic habitats and the aquatic community of short-term water quality degradation, direct disturbance, and/or channel response. However, all the action alternatives require some level of post-construction adjustment to the channel, and all of the projects likely include channel, bank, or floodplain treatments that may not reach full resistance within the first couple of years. The proposed projects would all be located along the same unregulated river; if a large flood were to occur within the first few years of construction, it could affect multiple project reaches, combining to increase the potential magnitude or duration of effect and/or causing a channel response that would eventually affect more than one reach. During an interim period of 5 years after construction, the probability of a large flood (e.g., 25-year recurrence or larger) is relatively high, because it would be the additive probability of the same statistical chance each (i.e., 20 percent over the interim period of 5 years). Therefore, such an event could be reasonably expected. Overall, the potential for aquatic habitat degradation during such an event under the restored condition on multiple project reaches would likely be less than under the No Project/No Action Alternative. However, locally worse conditions and/or flood damage could pose a risk of combining with similar effects in other reaches and might occur together under the action alternatives and other reasonably foreseeable restoration projects. Therefore, the cumulative risk of temporary aquatic habitat degradation would be significant and implementing the action alternatives could result in a considerable contribution to a potentially significant cumulative impact on aquatic habitats and the aquatic community.

Mitigation Measure 3.16-11A: Cumulative Biological Resources – Implement Alternative-Specific Measures to Minimize or Correct Temporary Water Quality Effects Following Construction.

This mitigation measure is identical to Mitigation Measure 3.16-10A.

Mitigation Measure 3.16-11B: Cumulative Biological Resources – Implement an Interim Adaptive Management Plan on the Upper Truckee River.

This mitigation measure is identical to Mitigation Measure 3.16-10A.

With implementation of the measures described above, the likelihood and potential magnitude of Impact 3.16-11 would not be substantially different than under the existing conditions or the No Project/No Action Alternative. Therefore, with implementation of Mitigation Measures 3.16-11A and 3.16-11B, Impact 3.16-11 would be less than significant.

IMPACT 3.16-12 (All Alts.)	**Cumulative Biological Resources – Long-Term Effects on Fisheries and Aquatic Resources.** *Under Alternatives 2 –5 the long-term ecosystem response to river and floodplain restoration is expected to improve habitat quality and functions for fish and aquatic macroinvertebrate communities in the Upper Truckee River. This effect, when combined with other river restoration projects in the Tahoe Basin, would be* ***cumulatively beneficial*** *and would not contribute to a significant adverse cumulative impact on fisheries and aquatic resources.*

As discussed in Section 3.5, "Biological Resources," the general abundance of the native fish community has declined substantially since the arrival of the first Euro-Americans in the Tahoe Basin in the 1840s. Several factors are believed to have contributed to the decline or extinction of native fish and the degradation of fish habitat in the Upper Truckee River and throughout the greater Tahoe Basin. Logging, water diversions, channelization, grazing, commercial harvesting, road building, and the introduction of nonnative fish and other aquatic organisms have contributed cumulatively to the change in the Upper Truckee River's fisheries composition and the degradation of the river's fish habitat (Murphy and Knopp 2000). The combined effects of several past activities and projects have cumulatively resulted in adverse impacts on fisheries and aquatic resources in the Upper Truckee River.

Many of the reasonably foreseeable projects (e.g., the Upper Truckee River and Marsh, airport, and Sunset Stables reach restoration projects) would result in long-term improvement of aquatic habitat conditions for the native fish and macroinvertebrate community. Specifically, such projects would prevent channel incision, increase channel sinuosity, decrease channel capacity, restore riparian vegetation communities, increase floodplain inundation, and restore ecologically important geomorphic processes. Overall, the combined effect of these future projects is expected to improve habitat conditions in the long term compared to current conditions. However, even with these future projects, conditions for fisheries and aquatic resources in the Upper Truckee River watershed would remain limited. For example, ongoing influences of existing urbanization and the presence of nonnative species would be expected to continue into the future, limiting the ability of the historic native fishery to fully recover.

The Upper Truckee River is a key migration corridor and rearing area for the entire Upper Truckee River watershed, implementing the No Project/No Action Alternative (Alternative 1) could limit the effectiveness of downstream restoration projects in enhancing populations of native or desirable fish species. Nevertheless, under this alternative, fish and aquatic habitat in the study area would not change in the long term because no changes would be made to the river system. The fish community and aquatic habitat conditions would continue to be affected by ongoing altered hydraulic and geomorphic processes and periodic treatments to address bank erosion. Implementing the No Project/No Action Alternative would not make a considerable contribution to the cumulative impact on fisheries and aquatic resources in the Upper Truckee River.

In the long term, implementing Alternative 2, 3, or 5 would restore geomorphic processes of the Upper Truckee River valuable to ecological functions, and implementing Alternative 4 would stabilize the river in place, limiting the progress of the current negative trend in habitat function. Proposed river restoration activities associated with Alternatives 2, 3, and 5 would substantially increase the length of the channel and the width of the riparian corridor and would restore natural processes within the study area, increasing available habitat for the fish and macroinvertebrate community. Increased sinuosity would improve pool development and maintenance, and a wider and more vigorous riparian vegetation community would lead to increased riparian cover and instream complexity with the introduction of woody debris. Many of the benefits of the restoration project would be realized over time, as functional geomorphic processes shape channel morphology and associated habitat features that provide important functions and values to the fish and macroinvertebrate community. These processes, which rely on regular disturbance resulting from flood events, would improve aquatic habitat functions and values over a period of several decades and would ensure that aquatic habitat would be maintained over time.

Alternative 4 would involve a combination of hard and soft stabilization to keep the river in its present configuration and would involve only minor changes to the existing golf course. River stabilization activities associated with Alternative 4 would not increase the length of the channel or the width of the riparian corridor and would not restore natural geomorphic processes within the study area. However, the stabilization measures would contribute to a small, incremental improvement to fish and aquatic resources by limiting future sediment inputs and creating additional habitat complexity where biotechnical approaches would be applied. Creation of the relatively small area of inset floodplain (0.4 acre) would result in localized improvement of conditions supporting the development of riparian cover and providing high-flow refugia for fish.

These effects, when combined with those of other ongoing and future river restoration projects in the Tahoe Basin (e.g., marsh, airport, Sunset Stables reaches, High Meadows) would be beneficial. No adverse, long-term cumulative effect on fisheries and aquatic habitats would occur.

No additional mitigation is required.

IMPACT 3.16-C13 (All Alts.)	Cumulative Biological Resources Vegetation and Wildlife – Effects on Introduction and Spread of Invasives. *Under the No-Project/No-Action Alternative, ongoing management would continue to limit introduction and spread of invasive plants in the study area, but invasive plants would continue to be introduced and spread within the vicinity of the study area. Under the action alternatives (Alternatives 2–5), construction activities could introduce or spread invasive plants, which in turn could increase the introduction and spread of invasive weeds and aquatic organisms. However, mitigation planned as part of the alternatives would substantially reduce the potential for construction activities to introduce and spread invasive species. Therefore, none of the alternatives would make a considerable contribution to a significant cumulative effect on the introduction and spread of invasive weeds and aquatic organisms. This impact would be* ***less than significant****.*

Under the No-Project/No-Action Alternative, ongoing management would continue to limit introduction and spread of invasive plants in the study area, but invasive plants would continue to be introduced and spread within the vicinity of the study area. Under the action alternatives (Alternatives 2–5), construction activities could introduce or spread invasive plants or aquatic organisms, which in turn could increase the introduction and spread of these invasives. The potential for causing these effects differs among the action alternatives. Ground disturbance is a major factor affecting the introduction and spread of invasive species and differs among alternatives: Alternative 2 and 5 would disturb the greatest and least acreage, respectively, and Alternatives 1, 3, and 4 would disturb comparable, smaller acreages. Mitigation planned as part of the alternatives would substantially reduce the potential for invasive species to be introduced and spread. Mitigation planned as part of the alternatives (Mitigation Measure 3.5-7) includes cleaning of construction machinery, use of seed and other erosion control materials free of invasive plant seed, and pre and post-construction monitoring and invasive plant removal. These measures would substantially reduce the potential for construction activities to introduce and spread invasive species, and consequently reduce opportunities for introduction and spread of invasive species relative to both existing conditions and conditions under the No-Project/No-Action Alternative.

Therefore, none of the alternatives would make a considerable contribution to a significant cumulative effect on the introduction and spread of invasive species. This impact would be less than significant.

No additional mitigation is required.

IMPACT 3.16-14 (All Alts.)	Cumulative Biological Resources – Effects on Special-Status Plants and Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, and SEZ). *When combined with beneficial effects of ongoing and future river restoration projects in the Tahoe Basin, the effects of the No Project/No Action Alternative are not expected to make a considerable contribution to the cumulative impact on sensitive botanical resources. Under Alternative 2 –5, the acreage and functions of sensitive habitats (jurisdictional wetlands, riparian vegetation, and SEZ) are expected to increase. Although the magnitude would be different under each alternative, this effect, combined with the effects of other ongoing and future river restoration projects in the Tahoe Basin, would make a considerable contribution to a* ***beneficial cumulative impact*** *on special-status plants and sensitive habitats. Potential effects of the project could be considerable and combine with effects of other actions on transport and delivery of coarse sediment; however, the incremental or combined consequences to channel and beach erosion are not predictable because of highly uncertain climate change influences (See Impact 3.16-8 (All Alts), especially on beach erosion. Conditions could range from worse than the existing degraded condition to a possible improvement regardless of changes in coarse-sediment delivery. Beaches support one of the most important populations of Tahoe yellow cress in the Tahoe Basin. Any changes to beach erosion processes near the river mouth could affect habitat for Tahoe yellow cress. With the unknown effects of climate change on beach erosion (could decrease or increase potential habitat/beach erosion) consideration of the potential cumulative effects to Tahoe yellow cress habitat remains too speculative for a meaningful significance conclusion.*

Under the No Project/No Action Alternative, the study area would remain unaltered from existing conditions, with the banks of the Upper Truckee River continuing to erode and widen, thereby limiting sensitive habitats within the riparian corridor. No planned or project-related removal of riparian vegetation or wetlands would occur as a result of implementing this alternative. Under the No Project/No Action Alternative, effects on sensitive habitats (i.e., continued degradation) would be similar to existing and ongoing conditions. When combined with the beneficial effects of ongoing and future river restoration projects in the Tahoe Basin (e.g., Upper Truckee River and Marsh, airport, Sunset Stables reaches), the effects of the No Project/No Action Alternative are not expected to constitute a considerable contribution to the cumulative impact on common and sensitive botanical resources.

Project implementation under Alternative 2 –5 could result in potential short-term construction-related impacts on special-status plant species. However, mitigation planned as part of these alternatives—conducting preconstruction surveys for special-status plant species, delineating Federally protected wetlands, implementing vegetation protection and revegetation measures, avoiding sensitive plant communities by project design, and compensating for the short-term loss of resources that could not be avoided—would minimize short-term construction-related impacts on common and sensitive vegetation resources and compensate for potential loss. The alternatives would increase habitat for special-status plant species and would increase the quantity and quality of wetlands and riparian vegetation, while minimizing project-related disturbances. When considered in combination with other restoration projects that would increase or improve habitat for special-status plant species, increase the quantity and quality of wetlands and riparian vegetation, and minimize project-related disturbances, these combined activities would provide cumulative benefits to sensitive botanical resources.

As discussed in Impact 3.16-8 (All Alts.), “Cumulative Geomorphology and Water Quality – Long-Term Modifications in Upper Truckee River Coarse Sediment Transport and Delivery Downstream,” depending on the alternative selected, conditions associated with the transport of bedload (i.e., sands and gravel) within the study area and into downstream reaches of the Upper Truckee River could either worsen, improve, or remain the same, depending on unpredictable climate change influences. Under Alternative 2, 3, or 5, project-generated changes to the river's channel bed profile, bank and bed materials, or hydraulic conditions that control transport of bedload could worsen conditions relative to the effects of historically declining watershed coarse-sediment yields on downstream channel erosion and beach erosion adjacent to the river mouth (e.g., at Cove East and Barton Beaches) or remain similar under the No Project/No Action Alternative and Alternative 4. Cove East and Barton Beaches support one of the most important populations of Tahoe yellow cress in the Tahoe Basin. Beaches support one of the most important populations of Tahoe yellow cress in the Tahoe Basin. Any changes to beach erosion processes near the river mouth could affect habitat for Tahoe yellow cress. With the unknown effects of climate change on beach erosion (could decrease or increase potential habitat/beach erosion) consideration of the potential cumulative effects to Tahoe yellow cress habitat remains too speculative for a meaningful significance conclusion.

No additional mitigation is required.

IMPACT 3.16-15 (All Alts.)	Cumulative Biological Resources – *Tree Removal and Forest Land Conversion. When combined with effects of ongoing and future river restoration and fuels reduction projects in the Tahoe Basin, effects of the No Project/No Action Alternative is not expected to make a considerable contribution to the cumulative impact on trees and forest land conversion. Implementing any of the action alternatives (2–5) would result in substantial native tree removal greater than 10 inches DBH, for golf course relocation, restoration, and access road construction, as well as a few trees greater than 30 inches DBH. The magnitude of proposed tree removal in the study area is considered "substantial" as defined in the TRPA Code of Ordinances for all action alternatives and would require a tree removal and management plan developed with TRPA. These measures planned as part of the action alternatives would minimize and compensate for loss of individual trees and forest conversion related to implementation of alternatives 2–5. The goals of fire fuel management programs in the Basin include improvement of forest health, where the focus is on reducing density by removing low-canopy to mid-canopy trees, which is not expected to result in changes to the distribution or abundance of forest vegetation types. Therefore, in combination with other tree removal for restoration projects and fire fuels management, the action alternatives' tree removal and the loss of trees greater than 30 inches DBH would be a* less than significant *impact.*

Under the No Project/No Action Alternative, the study area would remain unaltered from existing conditions, with the banks of the Upper Truckee River continuing to erode and widen. This condition would likely result in the long-term degradation of woodland habitats within the riparian corridor and floodplain, which could involve the loss of individual trees from undercut banks. Implementation of bank treatments and repairs would continue on an emergency or as-needed basis, primarily in response to major flood events, and would be limited to locations with vulnerable public or golf infrastructure or private property. No planned or project-related removal of trees would occur as a result of implementing this alternative. Under the No Project/No Action Alternative, effects on trees and conversion of forestland would be similar to existing and ongoing conditions. Management activities including fuels treatment thinning within Washoe Meadows SP, Lake Valley SRA, and throughout the Tahoe Basin would continue to manage fire fuel and improve forest health. When combined with effects of ongoing and future river restoration and fuels management projects in the Tahoe Basin, the effects of implementing the No Project/No Action Alternative are not expected to result in a significant cumulative impact on trees and no conversion of forest land would occur.

The tree removal estimates for the action alternatives include trees that may be removed in the future for additional forest health and fuels treatments prior to, or in the absence of, project implementation, as part of State Parks' existing Lake Sector Wildfire Management Plan. Although State Parks has treated much of the study area for fuels reduction, some proportion of trees estimated for removal may be removed in the future regardless of project implementation (Walck, pers. comm., 2010) to further reduce densities in some areas. Additionally, some lodgepole pines that would be removed within the riparian corridor as part of the proposed geomorphic restoration or river stabilization would be removed regardless, i.e., as part of State Parks' existing management objectives to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (related to the existing Riparian Hardwood Restoration Project).

Regarding the potential for cumulative conversion of forest land, only Alternative 2 involves conversion of existing forest to a non-forest use (i.e., conifer forest to golf course west of the river in Washoe Meadows SP). This is determined to be a significant impact on its own and could be interpreted as an additional increment of conversion with other past projects and present conditions. Reasonably foreseeable future projects, however, do not include substantial conversion of forest land to non-forest uses, so the cumulative condition would not be worsened in the future, except for the influence of implementing Alternative 2. Therefore, a cumulative impact, where multiple, reasonably foreseeable future projects combine to increase overall forest land conversion, would not occur.

Implementing any of the action alternatives (2–5) would result in substantial removal of native trees greater than 10 inches DBH for golf course relocation, restoration, and access road construction, as well as a few trees greater than 30 inches DBH. The final acres, number, and stand condition of trees removed would be determined in cooperation with TRPA prior to construction. The magnitude of proposed tree removal in the study area is considered "substantial," as defined in the TRPA Code of Ordinances, for all action alternatives and would require a tree removal and management plan developed with TRPA. Substantial tree removal and the loss of trees greater than 30 inches DBH would be a significant impact on its own. In addition, other river restoration projects and fire fuels management projects would involve removal of trees over 10 inches DBH, which would combine to cause a significant cumulative impact related to tree removal. However, as a counter balance to this effect, geomorphic, floodplain, and SEZ restoration would lead to a net increase in riparian tree abundance, cover, and productivity over time, following project implementation. Furthermore, measures to minimize tree removal and develop a tree removal and management plan (Mitigation Measure 3.5-6 [Alternatives 2–5]) planned as part of these alternatives would minimize and compensate for loss of individual trees and forest conversion related to implementation of the action alternatives. With the adoption of these measures, implementing Alternative 2–5, when combined with past, present, and reasonably foreseeable future projects (e.g., south shore fuels reduction projects and other restoration projects that require tree removal) would not threaten, regionally eliminate, or contribute to a substantial reduction in the distribution or abundance of common conifer forest. Also, planning for a South Shore fuels reduction project is under way. The fuels reduction program would involve substantial removal of fire fuel, including trees, from the Upper Truckee River watershed. However, the goals of this fire fuel management program include improvement of forest health. The focus would be on reducing density by removing low-canopy to mid-canopy trees, and the tree removal is not expected to result in changes to the distribution or abundance of forest vegetation types. Therefore, in combination with other tree removal for restoration projects and fire fuels management, the action alternatives' tree removal and the loss of trees greater than 30 inches DBH would be a less than significant impact.

IMPACT 3.16-16 (All Alts.)	Cumulative Biological Resources – Effects on Common or Special-Status Wildlife Resources. *When combined with beneficial effects of ongoing and future river restoration projects in the Tahoe Basin, effects of the No Project/No Action Alternative are not expected to make a considerable contribution to the cumulative impact on common and sensitive wildlife resources. Under Alternative 2, 3, and 5, the long-term ecosystem response to river and floodplain restoration is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. Alternative 4 ecosystem response would also be beneficial, however on a lesser scale than Alternatives 2, 3, and 5. River and floodplain restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). This effect, when combined with the effects of other ongoing and future river restoration projects in the Tahoe Basin, would be a considerable contribution to* ***beneficial cumulative effects*** *on common and special-status wildlife associated with riparian, wetland, and aquatic habitat, and wildlife habitats.*

Under the No Project/No Action Alternative (Alternative 1), the study area would remain unaltered from existing conditions, with the banks of the Upper Truckee River continuing to erode and widen, thereby limiting sensitive habitats within the riparian corridor and floodplain. No planned or project-related removal of riparian vegetation or wetlands would occur as a result of implementing this alternative. Under the No Project/No Action Alternative, impacts on sensitive habitats (i.e., continued degradation) would be similar to existing and ongoing conditions. However, when combined with beneficial effects of ongoing and future river restoration projects in the Tahoe Basin (e.g., Upper Truckee River and Marsh, airport, Sunset Stables reaches, High Meadows), effects of the No Project/No Action Alternative are not expected to make a considerable contribution to the cumulative impact on common or sensitive wildlife resources.

Implementing Alternative 2 would remove and fragment approximately 60 acres of common upland habitat (primarily degraded Jeffrey pine and lodgepole pine forest) and increase disturbance levels west of the Upper Truckee River. However, implementing Alternative 2 is not expected to substantially affect the breeding productivity or population viability of any common or special-status wildlife species, cause a change in species diversity locally or regionally, or remove any known or potentially significant wildlife movement corridors. In addition under areas that are currently golf course adjacent to the river would be restored to riparian vegetation, increasing habitat corridor connectivity. Because these common wildlife habitat types are abundant and widely distributed locally and regionally, implementing Alternative 2, when combined with past, present, and reasonably foreseeable future projects (e.g., Upper Truckee River and Marsh, airport, and Sunset Stables reach restoration projects; South Shore fuels reduction projects), would not threaten, regionally eliminate, or contribute to a substantial reduction in the distribution or abundance of habitat for common or special-status wildlife associated with these communities in the project region. Also, mitigation planned as part of these alternatives includes conducting focused preconstruction surveys for special-status wildlife (Mitigation Measures 3.5-9A and 3.5-9B [Alts. 2–5]), which would avoid the loss of individuals, nests, or roost sites of special-status wildlife species during construction. Therefore, the golf course reconfiguration and trail development component of Alternative 2 would not make a considerable contribution to the cumulative impact on common and sensitive wildlife resources.

Under Alternative 2, 3, or 5, the long-term ecosystem response to river and floodplain restoration is expected to substantially improve habitat quality and functions for riparian and aquatic wildlife, including special-status species such as yellow warbler, willow flycatcher, and waterfowl. Alternative 4 ecosystem response would also be beneficial, however on a lesser scale than Alternatives 2, 3, and 5 because floodplain function would not be restored. Restoration would also increase the size and enhance functions of TRPA-designated wildlife habitats of special significance (i.e., wetlands, meadows, and riparian areas). This effect, when combined with those of other ongoing and future river restoration projects in the Tahoe Basin (e.g., marsh, airport, Sunset Stables reaches, High Meadows), would be a beneficial contribution to cumulative impacts on common and special-status wildlife associated with riparian, wetland, and aquatic habitat, and wildlife habitats of special significance.

No additional mitigation is required.

IMPACT 3.16-17 (All Alts.)	**Cumulative Earth Resources – Soil Erosion, Sedimentation, and Loss of Topsoil.** *River and floodplain modifications would occur under any of the action alternatives and upland modifications under Alternative 2. Although temporary BMPs would be implemented, erosion, sedimentation, and loss of topsoil could occur during summer construction seasons or intervening winters. However, these effects would be minimized by mitigation features planned as part of the alternatives development. If BMP failures were to occur at reasonably foreseeable projects in the vicinity, it would not be expected that those effects would contribute to a cumulatively significant erosion, sedimentation, or loss of topsoil impact because these failures would be localized in their extent. This cumulative impact would be* ***less than significant****.*

Under Alternative 1, formerly disturbed areas (i.e., trails, roads, and streambanks) would continue to erode, and on-site construction equipment would continue to be operated as it is today (i.e., for fuels management); thus, soil erosion would remain comparable to the current conditions. Construction would be conducted, as necessary, to stabilize streambanks and/or infrastructure, but this potential for emergency repairs would be the same as current conditions.

Runoff and water quality effects are addressed above in the discussions of hydrology and flooding and of geomorphology and water quality. All four action alternatives (Alternatives 2–5) would require construction within active stream channels and their adjacent floodplains. Upland modifications would be implemented under Alternative 2. Although temporary BMPs would be implemented, erosion, sedimentation, and loss of topsoil could occur during construction. All the action alternatives would incorporate on-site construction phase management plans through mitigation planned as part of the alternative (Mitigation Measure 3.6-1). The planned controls include many specific measures to be implemented by State Parks, including restricted disturbance areas and duration, BMPs that are effective up to the 20-year precipitation event and 50-year streamflow event, discrete measures for various subdrainage areas on each side of each water body, construction equipment and vehicle restrictions, specific winterization guidelines, protection for transported and stored materials and debris, topsoil salvaging, custom dewatering/bypassing plans, rewetting requirements, and monitoring requirements regarding BMP effectiveness and remedial action requirements. The controls would limit the likelihood and magnitude of potential erosion, sedimentation, and loss of topsoil impacts. The reasonably foreseeable development projects in the project vicinity and stream restoration projects along the Upper Truckee River could have active construction during overlapping periods and exposure to large storm events and/or high flows during intervening winters. Each proposed project is expected to take many measures to reduce the potential risk related to erosion, sedimentation, and loss of topsoil, including:

- restricting the area and duration of construction disturbance to the absolute minimum necessary and
- designing, installing, and maintaining temporary BMPs to protect disturbed areas and minimize soil erosion; prevent surface runoff interaction with disturbed surfaces; and limit the potential for release of sediment, nutrient, or otherwise contaminated water into water bodies outside the construction disturbance zone.

The performance standards for BMPs on the reasonably foreseeable projects would be expected to be the same as those for mitigation identified for the action alternatives, but it is possible that the BMPs could fail, particularly if unusual runoff conditions occur that exceed the BMP design capacity. However, it is highly unlikely that a BMP failure at one project site could contribute to a cumulative erosion, sedimentation, or loss of topsoil impact because these failures would be localized in their extent. Therefore, implementing any of the alternatives would not contribute to a significant cumulative impact.

No additional mitigation is required.

IMPACT 3.16-18 (All Alts.)	**Cumulative Earth Resources – Land Coverage Changes.** *Implementing Alternative 2, 3, or 5 would decrease coverage in the most sensitive lands (LCD 1b) adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek. Implementing Alternative 2 would relocate coverage currently within LCD 1b to higher capability and previously disturbed lands west of the river. Under Alternatives 1 and 4 lands adjacent to the Upper Truckee River and Angora Creek would continue to support golf uses. While coverage would increase under Alternative 4, proposed coverage would still be within limits allowed in the study area, as determined by TRPA. Coverage effects would either be beneficial or less than significant under all alternatives. Because implementing any of the action alternatives would either contribute to a beneficial effect on land coverage (Alternatives 2, 3, and 5) or be within the allowable land coverage limits(Alternative 4), and other projects would be required to either mitigate or have no effect on coverage, a cumulative adverse land coverage impact would not occur. This cumulative impact would be* ***less than significant.***

In the past 150 years, much of the Upper Truckee River watershed has been converted to developed land uses. Based on a review of land cover within the watershed (using the CDF 2002 and California Interagency Watershed Mapping Committee 2004 GIS data layers), this portion is about 9 percent, concentrated in the lower elevation areas of the watershed, and includes much of the project vicinity. Urban development has been altering hydrologic, geomorphic, and habitats commonly encroaching on the most sensitive lands located within the SEZ. Past projects include the Lake Tahoe Golf Course within the study area, South Lake Tahoe Airport, U.S. 50, and the Tahoe Keys Marina and residential and commercial areas within the watershed (e.g., Meyers, North Upper

Truckee). Coverage within the study area would not be modified under Alternative 1, and implementing Alternative 2, 3, or 5 would decrease coverage in the most sensitive lands (LCD 1b) adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek, decreasing existing land coverage within sensitive lands in the watershed. Implementing Alternative 2 would relocate coverage currently within LCD 1b to higher capability and previously disturbed lands west of the river. Alternatives 2, 3, or 5 would either decrease coverage or result in the same coverage in other LCDs, therefore either decreasing coverage or having no effect on coverage within those LCDs. While coverage would increase under Alternative 4, proposed coverage is still within the limits allowed in the study area, as determined by TRPA.

Other reasonably foreseeable projects in the vicinity include a range of projects that have individually varied effects on coverage. Some projects may potentially increase the amount of impervious surfaces (e.g., bike trails, development projects, Upper Truckee River and Marsh Restoration Project), others may potentially decrease the amount of impervious surfaces (e.g., Lake Tahoe Boulevard Enhancement, Elks Club, Lake Tahoe Airport Runway Restoration), and others may include no coverage changes (many restoration projects in the watershed). Proposed projects that would increase the amount of impervious surfaces would be required to incorporate mitigation to limit their incremental contribution. Projects that propose to remove coverage would have a beneficial effect on land coverage. Therefore, when viewed in connection with the effects of other projects, a cumulative impact on land coverage would not be expected to occur.

No additional mitigation is required.

IMPACT 3.16-19 (All Alts.)

Cumulative Scenic Resources — Short-Term and Long-Term Impacts on the Existing Visual Character. *Short-term and long-term changes associated with implementing any of the action alternatives would be visible or partially visible from U.S. 50 within Roadway Travel Unit 36B, from trails within Washoe Meadows SP, and from surrounding neighborhoods. However, short-term construction-related effects would be intermittent and temporary, and changes associated with implementing Alternative 3, 4, or 5 would be minimal and are not considered adverse. Therefore, implementing Alternative 3, 4, or 5 would not contribute to a potentially significant cumulative short-term impact on scenic resources. Implementing Alternative 2 would result in substantial long-term changes in views of Washoe Meadows SP. However, views of the golf course would be screened by implementing a measure that would involve natural landscaping and forest management to screen views of the golf course from surrounding neighborhoods and trails. The residual impacts would be minimal, localized, and would not contribute to a potentially significant cumulative impact on scenic resources. Thus, the project's contribution to this cumulative impact would be* ***less than significant****.*

In the short term, implementing Alternatives 2–5 would introduce construction activities and staging areas into the study area that would temporarily change views over a period of approximately 2–4 years. Construction activities associated with other projects that occur within the same timeframe as the action alternatives could result in a cumulative change in visual character associated with those activities. However, all construction-related effects would be intermittent and temporary. For this reason, short-term impacts under Alternatives 2–5 would be less than significant and would not make a cumulatively considerable contribution to a potentially significant cumulative impact.

Other projects that include substantial tree removal or other long-term changes in views could result in a cumulative effect on scenic resources in the project vicinity. Although some ongoing tree removal related to fuels management would occur, no other ongoing projects or other projects planned in the study area or the project vicinity would involve substantial tree removal or other substantial changes that would alter the scenic character of the area. Tree removal related to fuels management would continue to occur in the vicinity of the study area and throughout the Tahoe Basin. Current forest management practices within this area include reducing fuels in the urban interface, often removing 50% of trees or more in some areas with the long-term goal of maintaining an open canopy and low-density forest for fire safety. These management actions open the viewscape adjacent to residences. Other past, present, and future restoration projects in the project vicinity could combine with one of the action alternatives to create a more natural landscape, which is desirable.

As described in Section 3.7, "Scenic Resources," implementing Alternatives 2–5 would result in long-term changes in views from U.S. 50, trails within Washoe Meadows SP, and adjacent golf course neighborhoods. Long-term views would change from golf course greens to a more natural landscape ranging from minor changes to the golf course to complete removal of the golf course. However, changes in views to a more natural landscape are considered desirable and are not considered an adverse change in views. Implementing Alternative 2 would result in significant long-term changes in views of Washoe Meadows SP related to tree removal and relocating golf course holes to the west side of the river. However, views of the golf course would be screened by implementing a measure planned as part of Alternative 2 (Mitigation Measure 3.7-2) that would involve natural landscaping and forest management to screen views of the golf course from surrounding neighborhoods and trails and that would reduce project-related long-term changes to a less-than-significant level. Implementing Alternative 4 would result in a more stabilized channel with abundant rock and biotechnical structures and treatments. Planting of rock armor and toes would screen the rock to make it look more natural.

Because long-term changes in views either would be desirable or would be screened by natural landscaping and forest management, all long-term visual character impacts associated with the project would be less than significant. A cumulatively significant scenic impact in combination with other reasonably foreseeable projects would not be anticipated.

No additional mitigation is required.

IMPACT 3.16-20 (All Alts.)	Cumulative Scenic Resources — Potential for Increase of Light and Glare. *Implementing Alternative 3 or 5 would not introduce any new sources of light or glare, and implementing Alternative 2 or 4 would introduce new lighting associated with the parking area improvements but would comply with TRPA Design Review Guidelines for lighting as part of alternatives development. Thus, while cumulative night lighting would be a potentially significant concern in the community, the project's contribution to this condition would be less than considerable and, therefore, the cumulative impact of the project would be **less than significant**.*

Under Alternative 3 or 5, no new facilities would be constructed, so no new sources of light or glare or skyglow (a glow that extends beyond the light source and reduces views of the nighttime sky) would be introduced to the study area. Under Alternative 2 or 4, the restroom facility proposed would be constructed of nonreflective materials and would not increase glare in the study area. No exterior lighting is proposed for the restroom facility. Lighting would be added to the newly paved parking area adjacent to the golf course entrance under these alternatives. Glare from nighttime lighting can be an annoyance to nearby residences and can reduce the quality of nighttime views. Nighttime lighting can also cause skyglow. Views of the nighttime sky around Lake Tahoe are a unique scenic resource. Implementing the proposed project and past, present, and reasonably foreseeable future projects would introduce new sources of lighting to the immediate neighborhood and region, contributing to the cumulative skyglow produced by development around the south shore of Lake Tahoe. However, as part of development of Alternative 2 or 4, all new lighting would be designed according to the TRPA Design Review Guidelines lighting standards, which require that lighting be directed downward and that lighting fixtures not exceed 10–12 feet in height (TRPA 1989:30-5 and 30-6). Because the new lighting would be near a parking area and clubhouse that are sources of existing lighting, and because the proposed lighting would be minimal and would be consistent with TRPA's lighting standards, implementing Alternative 2 or 4 would have a less-than-considerable contribution to skyglow. Therefore, under all alternatives, this cumulative impact would be less than significant, because none of the alternatives would make a cumulatively considerable contribution.

No additional mitigation is required.

IMPACT 3.16-21 (All Alts.) **Cumulative Recreation Resources — Short-Term and Long-Term Reductions in Golf and Spring, Summer, Fall, and Winter Outdoor Recreation Opportunities.** *Short-term changes associated with all of the alternatives could temporarily reduce existing recreation opportunities during construction. However, short-term construction-related impacts would be intermittent and temporary. Therefore, implementing any of Alternatives 1—5 would not contribute to a potentially significant cumulative impact on recreation opportunities. Implementing Alternative 3 or 5 would have a significant impact on golfing opportunities. However, other cumulative projects would not involve long-term adverse changes to golfing facilities. Therefore, although implementing Alternative 3 or 5 would result in a significant reduction in golf recreation opportunity on its own, other reasonably foreseeable future projects do not involve further reduction of golf recreation resources; therefore, a significant cumulative impact would not occur. Implementing Alternative 1, 2, or 4 in combination with other projects would not make a considerable contribution to a potentially significant cumulative impact related to short-term and long-term reductions in golf and spring, summer, fall, and winter outdoor recreation opportunities. Currently, no PAOTs are assigned to recreational facilities within the study area. Continuation of recreation opportunities in the study area would likely result in assignment of PAOTs, under Alternatives 1–4 and the need for PAOT allocation under Alternative 5 would be evaluated in a future planning effort. Thus, the project's contribution to a cumulative recreation or PAOT capacity effect would be* ***less than significant****.*

Implementing Alternatives 2–5 would temporarily reduce existing recreation opportunities during construction, and implementing several other projects in the vicinity of the study area would also reduce existing recreation opportunities in the short-term. Projects that could be constructed within a time frame similar to that of any of the action alternatives involve improvements/restoration along different rivers and streams, such as Cold Creek, and the Upper Truckee River that could reduce water-related recreation opportunities, as well as access to existing trail systems. Trail system projects include the Greenway Bike Trail Project, Sawmill 2 Bike Path and Erosion Control Project, and the Lake Tahoe Boulevard Enhancement Project, which will provide new bike trails and enhance existing bike trails. Other projects will improve public access to the Upper Truckee River and Cold Creek.

Constructing these projects would temporarily reduce existing recreational opportunities in the surrounding area; however, many other recreation opportunities exist in the South Lake Tahoe area and throughout the Tahoe Basin which could accommodate increased recreation use. Additional temporary use would not likely focus on one specific recreational area. For these reasons, short-term impacts on recreation opportunities under Alternatives 2–5 would be less than significant and would not make a cumulatively considerable contribution to a potentially significant cumulative impact.

No other projects exist that would reduce or eliminate golfing opportunities in the surrounding area in the long term. Although implementing Alternative 3 or 5 would have a significant impact on golfing opportunities in the study area, there would be no cumulative or combined effect because the other projects would not involve long-term adverse changes to golfing facilities. Therefore, although implementing Alternative 3 or 5 would cause a considerable contribution, the overall cumulative effect on golfing opportunities would not be significant. Implementing the No Project/No Action Alternative or Alternatives 2 or 4 would have a less-than-significant impact on golfing opportunities and would not make a considerable contribution to an overall cumulative effect.

None of the project alternatives would have a significant effect on any other spring, summer, fall, or winter outdoor recreation opportunities in the long term. While Alternative 5 would discontinue the snowmobile track on the driving range. Other winter recreation activities (i.e., snowshoeing, cross-country skiing) would continue informally in the long-term in the study area. Although snowmobiling in the study area would be eliminated under this alterative, snowmobiling is available at Tahoe Paradise Golf Course and Zephyr Cove Snowmobiling. In addition, other proposed trail and river access projects in the South Lake Tahoe area would improve outdoor recreation opportunities in the long term and would not result in an adverse cumulative effect on recreation opportunities.

Currently, no PAOTs are assigned to recreational facilities within the study area. Continuation of recreation opportunities in the study area would likely result in assignment of PAOTs, under Alternatives 1–4 and the need for PAOT allocation under Alternative 5 would be evaluated in a future planning effort. The Upper Truckee River Restoration and Golf Course Reconfiguration Project qualifies under the EIP for PAOT allocation from the existing pool (6,215 available for summer-day use and 7,927 available for winter-day use [TRPA 2007: 10-9]) available for the Golf Course and for the driving range snowmobile uses, respectively.

Therefore, implementing the project would not make a considerable contribution to a cumulative effect on recreation opportunities or PAOT capacity.

No additional mitigation is required.

IMPACT 3.16-22 (All Alts.) **Cumulative Cultural Resources – Damage to or Destruction of Significant Documented Cultural Resources, As-Yet Undiscovered Cultural Resources, or Human Remains.** *Research conducted for the project indicates that the study area contains four prehistoric cultural resources that are considered significant as defined by CEQA, Section 106, and TRPA criteria. As-yet undiscovered cultural resources might also be present within the study area. However, protection of cultural resources planned as part of alternatives development would reduce impacts to a less-than-significant level. Therefore, project-related activities in combination with other projects would not combine to result in a significant cumulative impact on important cultural resources in the project vicinity. The project's cumulative impact would be* ***less than significant****.*

Cultural resources in the study area and surrounding region generally consist of early Native American habitation and resource processing sites and buildings and structures associated with late 19th and early 20th century agricultural, logging, and recreational industries. Particularly from the latter half of the 20th century to the present, prehistoric sites and historic-era buildings and structures have been destroyed, disturbed, and modified. During this period, the creation and enforcement of various regulations such as CEQA that protect cultural resources have substantially reduced the rate and intensity of these impacts; however, even with these regulations, cultural resources are still degraded or destroyed as cumulative development proceeds in the Tahoe Basin.

Research conducted for the project indicates that the study area contains four prehistoric cultural resources that are considered significant as defined by CEQA, Section 106, and TRPA criteria. As-yet undiscovered cultural resources may also be present in the study area. However, protection of cultural resources planned as part of alternatives development (Mitigation Measures 3.9-1 through 3.9-3) would reduce impacts on prehistoric and historic-era resources and human interments to a less-than-significant level under all action alternatives by avoiding impacts on documented significant cultural resources and by requiring that work be stopped and measures implementing to protect cultural resources and human remains if they are discovered during ground-disturbing activities. Therefore, the action alternatives would comply with CEQA, Section 106, and TRPA guidance and would not incrementally contribute to any significant cumulative impacts on important cultural resources in the project vicinity. Under the No-Project/No-Action Alternative (Alternative 1), construction activities that could potentially damage or destroy undocumented, potentially significant, cultural resources would not occur. However, impacts of natural forces, such as erosion and weathering, could continue to gradually destroy these resources or reduce their information potential and cultural values. This would not be a change from existing conditions and this effect could potentially occur throughout the Tahoe Basin. Consequently, the project's effects would not combine with other projects to result in a significant cumulative effect on cultural resources.

No additional mitigation is required.

IMPACT 3.16-23 (All Alts.) **Cumulative Transportation, Parking, and Circulation – Construction and Operation Impacts on the Local and Regional Circulation System.** *Implementing any of the action alternatives (Alternatives 2–5) would generate construction traffic. Reasonably foreseeable projects in the vicinity of the study area could also generate construction-related traffic. However, none of the action alternatives in combination with other projects would combine to result in an overall significant impact on traffic in either the short term or the long term. The project's cumulative impact would be* ***less than significant****.*

Implementing any of the action alternatives (Alternatives 2–5) would generate construction-related traffic (Under the No-Project/No-Action Alternative [Alternative 1], no substantial construction activities would occur in the study area.). Construction-related traffic would be similar under all action alternatives. Mitigation planned as part of the action alternatives includes a traffic control plan (Mitigation Measure 3.10-3), which would follow standards of the agency responsible for the affected roadway. Measures typically used in traffic control plans include advertising of planned lane closures, warning signage, a flag person to direct traffic flows when needed, and methods to ensure continued access by emergency vehicles. During project construction, access to existing land uses would be maintained at all times, with detours used as necessary during road closures. This plan would reduce effects on transportation and circulation. Nonetheless, construction activities would generate some additional traffic.

Construction-related traffic also would be generated by reasonably foreseeable projects in the vicinity (e.g., Sunset Stables Restoration Project, El Dorado U.S. 50, Segment 2—Lake Tahoe Airport to U.S. 50/SR 89 Junction Water Quality Improvement Project, and El Dorado SR 89, Segment 1—Luther Pass to Meyers Water Quality Improvement Project).Other projects in the vicinity would be constructed at various times during the summer construction period over the life of the proposed project, but they would not result in a substantial combined peak traffic congestion impact in the project vicinity because all the construction projects together would generate a small fraction of the overall traffic on local and regional roadways and would not be sufficient to alter the level of service (LOS). Because implementing any of the action alternatives would not result in an unacceptable LOS at intersections that receive project construction traffic, the combined impact would not be significant in the short term. Furthermore, implementing any of the action alternatives would not result in a contribution to any ongoing postconstruction increase in traffic because the long-term traffic generation resulting from any of the alternatives would range from not substantially different from to much less than existing conditions. Because constructing any of the action alternatives would not result in an unacceptable LOS at intersections that receive project construction traffic, the combined effect would not be significant in the short term.

Implementing any of the action alternatives would not result in a long-term increase in recreational use of the study area compared to existing conditions and the No-Project/No-Action Alternative (Alternative 1) traffic loads, and in combination with other projects would be insufficient to create an unacceptable LOS, or otherwise cause a cumulatively significant effect on transportation or circulation. Similarly, the parking improvements associated with Alternatives 2 and 4 would not increase in public use of the study area and other projects would not increase parking demand or decrease parking capacity in the vicinity of the study area. Alternatives 1 and 3 would not modify the unpaved parking area and Alternative 5 would decommission and restore the compacted soils in this unpaved parking area, Thus, implementing any of the action alternatives would not result in a considerable contribution to a cumulatively significant effect on parking.

In summary, implementing any of the alternatives would not cause a cumulatively significant traffic or parking impact, nor contribute considerably to any cumulatively significant effect on transportation, parking, or circulation. This cumulative impact would be less than significant.

No additional mitigation is required.

IMPACT 3.16-24 (All Alts.) **Cumulative Air Quality — Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors.** *Construction-related oxides of nitrogen (NO_X) emissions from implementation of any of the action alternatives (Alternatives 2–5) and simultaneous construction projects in the Tahoe Basin could violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations. Construction-generated emissions of reactive organic gases (ROG), NO_X, and respirable particulate matter (PM_{10}) would be reduced with mitigation planned as part of alternatives development and similarly would be reduced for other related projects. Therefore, a cumulative impact related to temporary construction emissions would not occur and implementing the project also not would result in a considerable contribution to a potentially significant cumulative impact. This cumulative impact would be* ***less than significant.***

Emissions of pollutants generated during construction are temporary in nature but can contribute substantially to air quality violations and nonattainment conditions. Implementing the No Project/No Action Alternative (Alternative 1) would not result in a project-related increase in criteria air pollutants and precursors and thus would not contribute to the cumulative condition. Emissions are associated primarily with heavy-duty construction equipment and fugitive dust emissions from ground disturbance and earth-moving activities.

Emissions associated with implementing Alternative 2, 3, 4, or 5 would exceed the applicable significance thresholds for NO_X and PM_{10}. In addition, when taken together, the project-generated emissions combined with the emissions from other projects undergoing simultaneous construction in the Tahoe Basin could violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations. This can be especially pronounced in the Tahoe Basin where—because of strict seasonal restrictions on construction activities—many projects are often under construction at the same time. Therefore, implementing Alternatives 2–5 could result in a considerable contribution to this potentially significant cumulative air impact.

Project construction is required to comply with all applicable TRPA, Bureau of Air Quality Planning, and Bureau of Air Pollution Control codes, specifically TRPA Code of Ordinances Chapter 25 (Best Management Practices), Chapter 64 (Grading Standards), and Chapter 91 (Air Quality Control). All EDCAQMD-recommended measures to reduce construction-generated emissions of ROG, NO_X, and PM_{10} would be incorporated as part of alternatives development. State Parks or its contractor would be required to (1) obtain all necessary TRPA permits and approvals and follow all required codes and procedures with respect to BMPs, grading and excavation for the project, and all construction-related and emissions-generating activities; (2) obtain all necessary El Dorado County permits and approvals and follow all required County laws and procedures with respect to BMPs, grading and excavation for the project, and all construction-related and emissions-generating activities; and (3) implement dust control measures for any grading activity that would create substantial quantities of dust in compliance with the provisions of Chapter 64.4 of the TRPA Code of Ordinances and the EDCAQMD CEQA Guidelines as part of alternatives development. Furthermore, it is anticipated that other projects in the Tahoe Basin would also be required to implement similar measures to reduce their emissions of ROG, NO_X, and $PM_{10,}$ to levels below those required by TRPA regulations, so temporary construction emissions would not combine to cause a significant cumulative impact. NO_X and PM_{10} emissions after implementation of these measures and recommended dust control measures would be reduced to a level below the applicable significance criteria; therefore, contributions by the project would not be considerable. In summary, a cumulatively significant impact related to temporary construction emissions is not expected to occur, and implementing Alternatives 2–5 would not result in a considerable contribution. This cumulative impact would be less than significant.

IMPACT 3.16-25 (All Alts.) **Cumulative Air Quality — Generation of Long-Term Operation-Related (Regional and Local) Emissions of Criteria Air Pollutants and Precursors.** *Long-term operation of Alternatives 2–5 would not result in the generation of regional unmitigated daily emissions that exceed any of the applicable thresholds. Therefore, implementing the project in connection with other projects would not result in a cumulatively considerable contribution to effects on regional emissions of criteria air pollutants or precursors. This cumulative impact would be* ***less than significant****.*

Implementing the No Project/No Action Alternative would not result in a project-related increase in criteria air pollutants and precursors and thus would not contribute to the cumulative condition. Regional stationary-, area-, and mobile-source emissions of ROG, NO_X, PM_{10}, carbon monoxide (CO), and sulfur oxides (SO_X) associated with implementation of Alternatives 2–5 were estimated using the URBEMIS 2007, Version 9.2.4, computer program. Based on the modeling conducted, long-term operation of Alternatives 2–5 would result in regional unmitigated daily emissions of approximately 1 lb/day of ROG, less than 1 lb/day of NO_X, less than 1 lb/day of PM_{10}, 1 lb/day of CO, and less than 1 lb/day of SO_X, which would not exceed any of the applicable thresholds. In addition, because implementing Alternatives 2–5 would not include the construction or operation of any major sources of stationary emissions, project implementation would not conflict with any air quality planning efforts. No trip-generating features or additional parking areas would be developed. Therefore, implementing Alternatives 2–5 would not result in changes to the LOS at signalized intersections in the project vicinity, nor would it result in increased long-term local emissions of CO from mobile sources. Thus, generation of long-term operation-related emissions from the project would not violate an air quality standard, contribute to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. Therefore, implementing Alternatives 2–5 would not make a cumulatively considerable contribution to regional emissions of criteria air pollutants or precursors. The long-term cumulative impact on regional emissions of criteria air pollutants and precursors would be less than significant.

No additional mitigation is required.

IMPACT 3.16-26 (All Alts.) **Cumulative Air Quality — Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Long-term operation of Alternatives 1–5 would not result in the generation of hazardous air pollutant (HAP) emissions. Therefore, implementing the project in combination with other projects would not result in a considerable contribution to the cumulative impact related to exposure of sensitive receptors to HAP emissions. This cumulative impact would be* ***less than significant****.*

No major stationary sources of HAP emissions would be constructed or operated with long-term operation of Alternatives 1–5, nor would implementing the project result in the generation of HAP emissions from on-site mobile sources (e.g., diesel truck traffic). In addition, no major sources of HAPs exist in the vicinity of the study area. Nonetheless, all stationary sources with the potential to emit HAPs are required to obtain permits from TRPA. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, specifically Chapter 91 (Air Quality Control) of the TRPA Code of Ordinances. Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions in the study area are expected to remain within established standards. Thus, neither construction nor operation of Alternatives 2–5 would expose sensitive receptors to substantial emissions of HAPs. As a result, implementing the project in combination with other projects would not result in a cumulatively considerable contribution to the exposure of sensitive receptors to substantial pollutant concentrations. This cumulative impact would be less than significant.

No additional mitigation is required.

IMPACT 3.16-27 (All Alts.) **Cumulative Air Quality — Exposure of Sensitive Receptors to Odors.** *Long-term operation of Alternatives 1–5 would not result in the generation of odors, nor would other foreseeable projects. Therefore, when viewed in connection with the effects of other projects, the proposed project would not result in a cumulatively considerable contribution to objectionable odors affecting a substantial number of people. This cumulative impact would be* ***less than significant****.*

Implementation of Alternatives 1–5would not result in any major sources of odor, and the project's proposed land use type is not one of the types commonly known to generate odors (e.g., landfill, coffee roaster, wastewater treatment plant). However, for both the proposed project in the study area, and for some other projects in the vicinity of the study area, construction would entail the use of on-site equipment that would emit diesel exhaust. Emissions of diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and the exhaust would dissipate rapidly from the source. Thus, construction and operation of Alternatives 1–5 viewed in combination with the effects of other projects, would not result in a cumulatively considerable contribution to objectionable odors affecting sensitive receptors. This cumulative impact would be less than significant.

No additional mitigation is required.

IMPACT 3.16-28 (All Alts.) **Cumulative Air Quality — Generation of Greenhouse Gases.** *Implementation of the project alternatives would not result in the generation of substantial short-term construction-related or long-term operation-related emissions of greenhouse gases (GHGs).The proposed project's emissions would not create a considerable contribution to cumulative GHG emissions and would not affect GHG reduction planning efforts. This cumulative impact would be* ***less than significant****.*

GHGs play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and is trapped by GHGs. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming (Ahrens 2003:536).

No air districts within California, including the EDCAQMD, have adopted a significance criterion for GHGs generated by nonindustrial projects. In addition, TRPA has not adopted a significance criterion for GHGs. No methodology has been specified for analyzing impacts related to GHG emissions or global climate change. However, by adopting Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, the State of California has established GHG reduction targets. Further, the State has determined that GHG emissions, as they relate to global climate change, are a source of adverse environmental impacts in California and should be addressed under CEQA. AB 32 did not amend CEQA, although the legislation identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501[a]). Senate Bill 97, in contrast, did amend CEQA by requiring the Governor's Office of Planning and Research to revise the State CEQA Guidelines to address the mitigation of GHG emissions or their consequences (Public Resources Code, Sections 21083.05 and 21097).

For the purposes of this draft EIR/EIS/EIS, the proper context for addressing climate change is in the discussion of cumulative impacts. Although the emissions of one project will not cause global climate change, GHG emissions from numerous projects throughout the world could result in the cumulative impact of global climate change.

AB 32 demonstrates California's commitment to reducing its rate of GHG emissions and associated contribution to climate change without limiting population or economic growth within the state. To meet the GHG emissions targets mandated by AB 32, California would need to generate a lower level of GHG emissions in the future than at the present time. For most projects, however, no simple metric is available to determine whether a single project would substantially increase or decrease overall GHG emissions levels or conflict with the goals of AB 32.

Although AB 32 focuses on major stationary and area sources of GHG emissions, the primary objective of the act is to reduce California's contribution to global warming by reducing California's total annual production of GHG emissions. The impact of GHG emissions on global climate change does not depend on whether the emissions were generated by stationary, mobile, or area sources or whether they were generated in one region or another. Thus, helping to meet the reduction goals mandated by AB 32 is the best metric for determining whether project implementation would contribute to global warming. This metric has been used below to determine where impacts of project implementation would be significant.

GHG emissions generated by the proposed project would predominantly be in the form of CO_2. Although emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the emission levels of these GHGs for the sources associated with construction and operation activities are relatively small compared with CO_2 emissions, even considering their higher global warming potential. Therefore, all GHG emissions for construction and operation are reported as CO_2.

Construction-related GHG emissions associated with restoration-, bridge-, and golf course-related construction activities were calculated using URBEMIS 2007, Version 9.2.4. Operation-related emissions, including direct (e.g., landscaping and maintenance) and indirect (e.g., vehicle trips) emissions were also calculated using URBEMIS 2007.

Construction-Generated Greenhouse Gas Emissions

Activities associated with construction of Alternative 2– 5 would occur in approximately three distinct phases during 2012–2014. During this time, construction-related GHG emissions would be associated with engine exhaust from heavy-duty construction equipment, material transport trucks, and worker commute trips. Implementing the No Project/No Action Alternative would not result in any construction-generated GHG emissions related to the project. However, non-project related fuels management (tree thinning) would continue by State Parks and others (e.g., USFS), as under existing conditions. Although any increase in GHG emissions related to the action alternatives would add to the quantity of emissions that contribute to global climate change, emissions associated with construction of the project would occur over a limited period. Furthermore, emissions would be lessened by reusing vegetation removed from the site instead of hauling it from the study area and bringing in all new vegetation. Also, the larger vegetation being reused onsite will allow for more CO_2 uptake than smaller new plantings initial capabilities.

Although for traffic analysis it was presumed that all trees would be hauled off-site, it is expected that some would be used for restoration (e.g., woody debris material) and chipped for mulch material. However, because the estimated tree removal is relatively large (1,640, 255, 590, and 247 trees under Alternatives 2, 3, 4, and 5, respectively) and the amount of material proposed to be used onsite or hauled off have not been defined additional mitigation (see below) has been developed to lessen the effects of tree removal on carbon sequestering and GHG emissions. The tree removal estimates for all action alternatives include trees that may be removed in the future for forest health and fuels treatments prior to, or in the absence of, project implementation, as part of State Parks' existing Lake Sector Wildfire Management Plan (Walck, pers. comm., 2010), to further reduce the densities in some areas. Other past, present and reasonably foreseeable fuels management projects will be implemented throughout the South Lake Tahoe area and the entire Lake Tahoe Basin as well. While carbon sequestering (discussed below) does occur in these trees if forest health is not obtained there is potential for the release of biological carbon stock due to fire. Additionally, some lodgepole pines that would be removed within the riparian corridor as part of the geomorphic restoration under Alternatives 2, 3, and 5 and as part of other foreseeable fuels management projects would also be removed as part of State Parks' and USFS existing management objectives to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (e.g., Blackwood Creek project). Effects of this conifer forest conversion on common and sensitive biological resources are discussed in Section 3.5, “Biological Resources”.

To establish additional context in which to consider the magnitude of project-generated construction-related GHG emissions, it may be noted that facilities (i.e., stationary, continuous sources of GHG emissions) in California that generate greater than 25,000 metric tons of CO_2 per year are mandated to report their GHG emissions to the California Air Resources Board (ARB) pursuant to AB 32. As shown in Table 3.16-3, estimated GHG emissions associated with construction of the project would be a maximum of 974 metric tons of CO_2 per year under the conditions for the highest emitting alternative (Year 1 [2012] of Alternative 2).

The project would generate substantially less emissions than the ARB reporting level of 25,000 metric tons of CO_2 per year and the cap-and-trade level of 10,000 metric tons of CO_2 per year set by AB 32. This information is presented for informational purposes only, and it is not the intention of State Parks to adopt 25,000 or 10,000 metric tons of CO_2 per year as a numeric threshold. Rather, the intention is to put project-generated GHG emissions in the appropriate context to evaluate whether the project’s contribution to the global impact of climate change is considered substantial.

Table 3.16-3
Summary of Modeled Construction-Generated Emissions of Greenhouse Gases under the Conditions for the Highest Emitting Alternative (Alternative 2)

Source	Total Mass CO_2 Emissions (metric tons)[1]
Construction Emissions [2]	
2012	608
2013	613
2014	562
Total Construction Emissions (2012-2014)	**1,783**

[1] The values presented do not include the full life-cycle of GHG emissions that occur over the production/transport of materials used during construction of the project, solid waste that occurs over the life of the project, and the end-of-life of the materials and processes that indirectly result from the project. Estimation of the GHG emissions associated with these processes would be speculative, would require analysis beyond the current state of the art in impact assessment, and may lead to a false or misleading level of precision in reporting of project-related GHG emissions.

[2] Construction emissions were modeled with the URBEMIS 2007 computer model. The URBEMIS 2007 model does not account for CO_2 emissions associated with the production of concrete or other building materials used in project construction. It also does not estimate emissions for GHGs other than CO_2, such as CH_4 and N_2O, because the emission levels of these other GHGs are expected to be nominal in comparison to the estimated CO_2 levels despite their higher global warming potential.

See Appendix I, “Air Quality Modeling Results,” for detailed model input, assumptions, and threshold calculations.

Source: Modeling conducted by AECOM 2009.

Operation-Related GHG Emissions

Operation-related GHG emissions would be generated by area and mobile sources during the life of the project. Area-source GHG emissions would be associated with landscaping and maintenance largely related to golf course lawn mowing, waste disposal, and other miscellaneous activities, under Alternatives 1–4, and potential GHG operation emissions under Alternative 5 would be evaluated under a separate planning process after site uses have been established. Existing maintenance and fuels reduction programs would continue as they do today under the No Project/No Action Alternative and all action alternatives. As described below, the largest, albeit minor, increase in emissions would occur under Alternative 2 with the relocation of nine holes of the golf course and development of a reconfigured regulation-length, 18-hole course. GHG emissions associated with off-site electricity generation would be similar to existing conditions under all alternatives. Municipal water use would generate off-site GHG emissions associated with water conveyance, treatment, and consumption; however, water usage is expected to be similar to or less than existing conditions under all alternatives and, therefore, would not create a substantial increase in GHG emissions. Mobile-source GHG emissions would be generated by the slight increase in project-related vehicle trips associated with Alternative 2. All other alternatives have vehicle trip levels similar to or less than existing conditions. Table 3.16-4 presents the operation-related GHG emissions associated with Alternative 2, the highest emitting alternative. Estimates of mobile-source GHG emissions are based on the traffic analysis prepared for the project, which estimates nine additional trips per day under Alternative 2, compared to existing conditions, which are associated with an increase of four employees needed for golf course maintenance. Based on the economic study prepared for this project, patron levels are expected to remain approximately the same as current levels because the golf course would operate the same as under existing conditions, and recreation areas would continue to be passive.

Each action alternative would create a net increase in riparian tree abundance, cover, and productivity as a result of geomorphic, floodplain, and SEZ restoration. However, this increase in riparian vegetation would be limited under Alternative 4 due to stabilization of the river. As discussed under construction related emissions, tree removal would vary by alternative, and other past, present and reasonably foreseeable fuels management projects will be implemented throughout the South Lake Tahoe area and the entire Lake Tahoe Basin as part of State Parks' and USFS existing management objectives. Net sequestration rate effects would vary depending on vegetation removed compared with vegetation habitat restored. Quantification is not feasible without accurate counts of vegetation types, age, and size to be added and removed by implementation of the projects and their respective sequestration rates, but it can be assumed that with increased riparian vegetation, and healthier forest conditions related to ongoing fuels management practices (therefore, less fire potential) carbon sequestration capabilities would be similar to existing conditions. Furthermore, the areas within the proposed golf course footprint under Alternative 2, where trees removed will be replaced by turf will still have some capability to sequester carbon, and even more so where native vegetation is proposed. However, the lack of capability for a detailed analysis remains too speculative for a meaningful significance conclusion.

As described in the construction related emissions, projects that generate more than 25,000 metric tons of CO_2 per year are mandated to report GHG emissions to ARB pursuant to AB 32. As shown in Table 3.16-4, the estimated increase in GHG emissions associated with operation of Alternative 2 would be approximately 12 metric tons of CO_2 per year. Again, the proposed project would generate substantially fewer emissions than the above-referenced threshold levels of 25,000 and 10,000 metric tons of CO_2 per year.

Table 3.16-4
Summary of Modeled Operation-Related Emissions of
Greenhouse Gases under the Conditions for the Highest Emitting Alternative (Alternative 2)

Source	Annual Mass CO_2 Emissions (metric tons/year)
Operation-Related Emissions of Alternative 2 (Year 2014)	
Area Sources [1]	0.3
Mobile Sources [1, 2]	11.5
Electricity Consumption [3]	0
Municipal Water Use [4]	0
Total Operation-Related Emissions	**11.8**

[1] Direct operation-related emissions (i.e., area and mobile sources) were modeled using the URBEMIS 2007 computer model, based on trip generation rates obtained from the traffic analysis, as well as the other assumptions and input parameters used to estimate criteria air pollutant emissions. Mobile source emissions assume nine trips per day above existing conditions. Year 2013 is the earliest year when completion of the project could occur. URBEMIS does not estimate emissions for GHGs other than CO_2, such as CH_4 and NO_2, because the emission levels of these other GHGs are expected to be nominal in comparison to the estimated CO_2 levels despite their higher global warming potential.

[2] Estimation of mobile-source emissions is based on the traffic study, which assumes four additional employees per day (nine additional trips).

[3] No additional substantial electricity consumption is expected under any of the alternatives.

[4] No additional substantial water consumption is expected under any of the alternatives.

See Appendix I, "Air Quality Modeling Results," for detailed model input, assumptions, and threshold calculations.

Source: Modeling conducted by AECOM 2009

Because construction and operation related emissions under all alternatives would be temporary, minimal, and finite in nature (i.e., would not be continuing), would not approach emissions levels of concern to agencies that have established emission reporting levels, the project proposes to reuse removed vegetation and revegetate and mulch where appropriate, and because carbon sequestering affects are too speculative for a meaningful significance conclusion the project's GHG effects would not be a considerable contribution to the cumulative condition.

Mitigation Measure 3.16-28: Cumulative Air Quality – Develop and Implement a Carbon Sequestering Plan for Project Related Tree Removal

Project construction will be handled in a manner that either extends the duration of its sequestration function (i.e., chip and used as mulch or till into soils) or is used for renewable energy purposes thereby minimizing landfill disposal or open burning of woodpiles.

With implementation of the mitigation measure 3.16-28, described above, Impact 3.16-28 would be less than significant by minimizing effects on carbon sequestering and GHG emissions.

IMPACT 3.16-29 (All Alts.)	Cumulative Noise – Short-Term or Long-Term Noise and Vibration Impacts. *Project-generated noise and vibration under the action alternatives would not combine with other noise sources in the project vicinity because construction noise and vibration would be temporary, would be at less-than-significant levels, and would occur within time periods exempted by applicable ordinances (i.e., daytime hours), and long-term noise would be similar to or less than current conditions, depending on the alternative selected. Therefore, the project in combination with other projects would not result in a significant cumulative impact on noise. This cumulative impact would be* ***less than significant****.*

Alternative 1 would not include any new stationary or area-noise sources. Use of the study area (e.g., golf course and passive recreation areas) would remain comparable to existing use. Heavy equipment and power tools (e.g., chainsaws, wood chippers) would continue to be used for public utility maintenance and fuels reduction programs. Lawn mowing, golfing activities, recreation, and other miscellaneous activities would continue as they do today. Thus, noise and vibration from implementing Alternative 1 would remain comparable to existing levels and not contribute to a significant cumulative noise or vibration impact. This impact would be less than significant. Implementing any of the action alternatives would generate noise from construction activity and project-generated construction traffic. A reasonably foreseeable project in the vicinity of the study area (e.g., Sawmill Bike Trail) also could generate construction-related noise; however, for several reasons, implementing any of the action alternatives would not make a considerable contribution to an overall significant effect on noise in either the short term or the long term. First, construction-related noise generated by any of the action alternatives would not exceed applicable regulations. Noise from construction activity that occurs between 8 a.m. and 6:30 p.m. (daily) is exempt from the provisions of the applicable TRPA regulations; noise from construction activity that occurs between 7 a.m. and 7 p.m. (weekdays) and between 8 a.m. and 5 p.m. (weekends and Federal holidays) is exempt from the provisions of the applicable El Dorado County regulations because noise sensitivity is less during these daytime periods than during quieter evening, nighttime, or early morning hours. Because noise-generating construction activities would not occur during the more noise-sensitive hours (i.e., before 8 a.m. and after 6:30 p.m. on weekdays or after 5 p.m. on weekends or Federal holidays) and project-generated construction traffic would not create a substantial increase in average local traffic noise levels (+3 dB or more), implementing any of the action alternatives would not contribute to any overall effect on noise that could be cumulatively significant in the short term. Second, implementing any of the action alternatives would not result in any substantial, ongoing postconstruction increase in noise because the land uses in the study area would be similar to current conditions following project implementation and because both traffic and area noise sources would not increase substantially (Alternative 2), would remain at existing levels (Alternatives 3 and 4), or would be reduced (Alternative 5). As calculated for Alternative 2, the action alternative with the greatest change in noise generation, the worst-case estimate for community noise level would be 44.6 dBA CNEL, an increase of 1.3 dBA CNEL, which is below the level of increase of perceptible change and well within the most stringent noise standard for land uses in the vicinity of the study area. Therefore, implementing any of the action alternatives in combination with other related projects would not result in a significant short-term or long-term cumulative effect on noise. This cumulative impact is less than significant.

No additional mitigation is required.

IMPACT 3.16-30 (All Alts.)	**Cumulative Public Services and Utilities – Increased Demand for and Interference of Public Services and Utilities.** *None of the alternatives would generate significant public service or utility demands. Implementing any of the action alternatives would not make a considerable contribution to an overall significant impact on traffic in either the short term or the long term. However, during construction, the presence of construction traffic and access interruptions could potentially hinder the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity in a timely manner. In addition, other projects occurring at the same time in the project vicinity could also hinder emergency response time. This project's impact would be avoided with planned traffic controls, alternative access routes, and other information presented in a Construction Traffic Management Plan. Furthermore, other projects in the vicinity would be required to coordinate any potential construction related interference with the appropriate entities. Therefore, the project in combination with other projects would not result in a considerable contribution to a cumulative effect on public services and utilities. Thus, this cumulative impact would be* ***less than significant****.*

Implementation of Alternatives 1–5 would not generate substantial demands for any public service or utilities and therefore would not result in a cumulatively considerable incremental contribution to local agency or utility demand. Although implementing Alternative 2 or 4 would result in a minor increase in electrical, water, and wastewater service use with addition of the restroom facility and lighting for the parking area improvements, the services needed would be minimal and would not create supply, treatment, distribution, or storage issues on the local water or electrical systems. Restored floodplain and riparian vegetation would need temporary irrigation; however, this use would be seasonal, would be short term, and would not be sufficient enough to increase water demand beyond that currently available.

Although implementing any of the action alternatives would not make a considerable contribution to an overall significant impact on traffic in either the short term or the long term, it could potentially lead to temporary interference with the ability of law enforcement, fire protection, and emergency medical service providers to provide emergency services to the project vicinity in a timely manner, especially if other reasonably foreseeable projects were to occur at the same time in the project vicinity. However, as described in Section 3.13, "Public Services and Utilities," controls planned as part of each action alternative (Mitigation Measure 3.13-1) would be implemented, including preparation of a Construction Traffic Management Plan, notification of public service providers, and provision of emergency routes, where potential access issues may occur. Furthermore, other projects in the vicinity would be required to coordinate any potential construction related interference with the appropriate entities as well. These planned actions would reduce the contribution of the project to a less than considerable level by avoiding the potential for interference with public service or emergency access.

No additional mitigation is required.

IMPACT 3.16-31 (All Alts.) **Cumulative Public Health and Risk of Upset – Potential Human Health Hazards from Exposure to Hazardous Materials, Wildland Fire Hazards, Mosquitoes Resulting from Increased Floodplain, and Increased Hazards to Aviation.** *In the short term, implementing any of the action alternatives (Alternatives 2–5) could expose construction workers to hazardous materials, and in the long term, implementing Alternative 2, 3, or 5 could increase the quality or extent of mosquito habitat or both. However, limiting exposure of workers to hazardous materials and controlling mosquito production in the study area as part of alternative development would reduce these effects to a less-than-significant level. Other projects occurring in the project vicinity would also be in compliance with Federal, State, and local regulations related to hazardous materials and would not substantially increase mosquito habitat. In addition, although past projects have created a significant wildland fire hazard condition and other projects could increase hazardous wildlife in the airport safety area, implementing any of the action alternatives in the short term or long term would not add to the existing wildland fire hazards or increase in hazardous wildlife in the airport safety area. Therefore, implementing the project in combination with other projects would not make a considerable contribution to a cumulative impact on public health. This cumulative impact would be **less than significant**.*

Hazardous Materials

In the short term, implementing any of the action alternatives (Alternatives 2–5) could expose construction workers to hazardous materials. However, limiting exposure of workers to hazardous materials (Mitigation Measure 3.14-2 [Alt. 2]) as part of alternatives development by evaluating, removing, and properly disposing of any hazardous substances that are encountered during construction would reduce hazards associated with the project alternatives but would not eliminate the risk of construction workers being exposed to hazardous materials. However, the remaining risk would not contribute to a greater overall cumulative impact because other construction activities would not occur in the same place or at the same time, and they would not involve the same workers. Furthermore, other projects occurring in the project vicinity would also be in compliance with Federal, State, and local regulations. Thus, implementing any of the action alternatives would not make a cumulatively considerable contribution to human health hazards from exposure to hazardous materials and would not cause a cumulatively significant effect.

Implementing any of the action alternatives would have no long-term effect on human health hazards from exposure to hazardous materials because following project implementation, the land uses of the study area and potential for exposure to hazardous materials would be similar to current conditions, and there would be no change from current conditions in the transport, use, release, or disposal of hazardous materials.

Under the No Project/No Action Alternative, on-site construction and operational equipment would continue to operate as it does today (e.g., for golf course mowing, fuels management); thus, the use of hazardous materials would remain comparable to current conditions. Potential emergency construction would be conducted as necessary. However, the nature and extent of these activities are unknown and would not be a direct result of implementing this alternative. The remaining risk would not contribute to a greater overall cumulative impact because other construction activities would not occur in the same place and they would not concurrently involve the same workers. Therefore, there would not be a short-term or a long-term contribution to human health hazards from the exposure of construction workers to hazardous materials.

Wildland Fire Hazards

Although the combined effect of reasonably foreseeable future actions would be expected to reduce wildland fire hazards, this anticipated reduction would not eliminate the significant adverse risk of wildland fire hazards that exists as a result of past actions (e.g., past fire suppression and other forest land management that has allowed fuels to accumulate, urban development in a forested landscape). In both the short and long term, implementing any of the action alternatives would not add to the existing wildland fire hazards. As mandated by the fire prevention and suppression policy in the *Lake Valley State Recreation Area General Plan*, a wildfire management plan has been implemented for Lake Valley SRA and Washoe Meadows SP. The plan identifies modified fire suppression methods that preserve sensitive unit resources while protecting human lives and property specific to these areas (State Parks 2006). Implementation of the wildfire management plan would eliminate any cumulatively considerable contribution of the action alternatives to wildland fuel hazards; thus, there would not be a cumulatively significant effect.

Under the No Project/No Action Alternative, State Park's recent fuel management practices are anticipated to continue and to maintain fuels and fire risks at a level comparable to existing conditions. Thus, there would not be an effect on wildland fire hazards individually or in combination with other projects as a result of implementing this alternative.

Hazards to Aviation

In the short term, construction activity associated with implementing any of the action alternatives (Alternatives 2–5) would reduce attraction of hazardous wildlife to the study area. Therefore, no short-term contribution to cumulative wildlife hazards to aviation would occur.

There are no records of bird-related air strikes in the FAA Birdstrike Database, and no airport staff members recall any bird-related air strikes (CDM 2007). In addition, habitat management, open space, recreational uses, and watershed improvement projects are considered compatible land uses in the airport Comprehensive Land Use Plan (City of South Lake Tahoe 2007).

Several other reasonably foreseeable river restoration projects are located in or close to the Critical Zone of the Lake Tahoe Airport, including the Upper Truckee River Middle Reaches 1 and 2 Stream Restoration Project, Upper Truckee Middle Reaches 3 and 4 Restoration Project, Sunset Stables Restoration Project, and Upper Truckee River and Marsh Restoration Project. Although implementation of these projects may not result in greater attraction of hazardous wildlife, most would increase floodplain inundation and the extent of riparian or wet meadow habitats and thus could increase attraction of one or more guilds of hazardous wildlife.

With the exception of Alternative 4, implementing any of the action alternatives would involve modifying the river channel and floodplain to reestablish an active floodplain and oxbow features that would receive overbank flows more often than under existing conditions. Implementing Alternative 4 would stabilize the river but would not create new floodplain. Implementing Alternative 2, 3, or 5 would increase the size of the floodplain in Airport Safety Area 3 by a small amount over existing conditions; however, most of the increase in floodplain size would be outside of the airport safety area. Because the increase in floodplain size in the airport safety area would be small, it is not anticipated that implementing the proposed project would noticeably increase the amount of hazardous wildlife in Airport Safety Area 3 relative to existing conditions. Therefore, implementing Alternative 2, 3, or 5 would not make a considerable contribution to an increase in hazardous wildlife in the airport safety area and would not result in a cumulatively significant effect.

Under Alternative 1 or 4, habitat conditions for hazardous wildlife would likely remain similar to existing conditions; thus, implementing any of these alternatives would not make a considerable contribution to a cumulative impact on hazards to aviation.

Mosquito Vector Control

In the short term, implementing any of the action alternatives (Alternatives 2–5) would not increase the quality or extent of mosquito breeding habitat and would not reduce the effectiveness of mosquito control efforts because areas disturbed by construction activities would provide less suitable habitat for mosquito breeding than the river channels and other natural vegetation currently provided.

In the long term, implementing Alternative 2, 3, or 5 could increase the quality or extent of mosquito habitat or both. Other restoration actions on the Upper Truckee River could also contribute to a cumulative adverse effect on mosquito vector control that could be additive with the effects of the proposed project. However, through development and implementation of control measures in coordination with the El Dorado County Vector Control District (EDCVCD) as part of alternatives development (Mitigation Measure 3.14-6), mosquito production in the study area would be limited to an amount comparable to or less than existing conditions. Therefore, implementing any of the action alternatives would not make a considerable contribution to effects on mosquito vector control and thus would not result in a cumulatively significant impact.

Under Alternative 1 or 4, it is anticipated that the quality and extent of mosquito habitat in the study area would remain similar to existing conditions and that the EDCVCD would continue its control mosquito production in the study area. Thus, these alternatives would not make a considerable contribution to a cumulative impact on mosquito vector control.

No additional mitigation is required.

IMPACT 3.16-32 (All Alts.)	Cumulative Population, Employment, and Housing – Potential Adverse Effects on Population, Employment, or Housing. *Implementing the No Project/No Action Alternative would have no effect on population, employment, and housing. Any of the action alternatives (Alternatives 2–5), together with other construction projects, would generate a temporary increase in employment in the South Lake Tahoe area from construction-related activities. However, this increase would be small relative to the existing labor pool in the City of South Lake Tahoe and nearby communities, and thus, it would not be a considerable contribution to cumulative effects on population growth or on demand for housing. This cumulative impact would be* ***less than significant****.*

Implementing the No Project/No Action Alternative would not contribute to any population, employment, and housing impacts because existing conditions would not be altered; therefore, implementing this alternative would not make a considerable contribution to a cumulative impact on population, employment, or housing.

Similar to Alternatives 2–5, other cumulative projects could involve short-term increases in population and employment and potentially would create a short-term need for additional housing because of the need to hire and house construction workers. Impacts on population, employment, and housing are identified as less than significant under Alternatives 2–5 because none of the alternatives would include population-generating land uses, which would create the need for new housing, and because the increase in employment associated with construction, although beneficial, would not be of great enough magnitude to substantially alter population patterns or housing demand. Furthermore, other foreseeable projects in the project vicinity are not expected to substantially alter the population patterns or housing demand. Therefore, none of the action alternatives would make a considerable contribution to a cumulative impact on population, employment, or housing.

No additional mitigation is required.

IMPACT 3.16-33 (All Alts.)	Cumulative Environmental Justice – Potential Adverse Effects on Environmental Justice. *Under the No Project/No Action Alternative, existing conditions would be maintained, and as a result, implementing this alternative would not make a considerable contribution to a cumulative environmental justice impact. For Alternatives 2–5, there is no indication that either the construction or the operation of the alternatives would affect identified minority or low-income populations to a greater degree than the general population of the surrounding area. Therefore, no cumulative effects on minority and low-income populations would occur. This cumulative impact would be* ***less than significant****.*

Under the No Project/No Action Alternative, no changes would occur, and existing conditions would be maintained. As a result, implementing this alternative would not make a considerable contribution to a cumulative impact on environmental justice.

For Alternatives 2–5, there is no indication that either the construction or the operation of the alternatives would affect identified minority or low-income populations to a greater degree than the general population of the surrounding area. Potential short-term impacts, such as construction emissions and elevated noise levels, would not have a disproportionately adverse impact on low-income or minority populations. Potential impacts would affect the general population in the surrounding area, not just low-income or minority populations. No significant long-term or short-term disproportionate adverse impacts on low-income or minority populations would result from implementation of Alternatives 2–5. For this reason, implementing any of these alternatives would cause no cumulative impact related to environmental justice.

No additional mitigation is required.

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4 OTHER REQUIRED SECTIONS

4.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

CEQA Section 21100(b)(2)(A) states that an EIR shall include a detailed statement setting forth "[i]n a separate section…[a]ny significant effect on the environment that cannot be avoided if the project is implemented." State CEQA Guidelines Section 15126.2(b) requires that an EIR describe any significant impacts, including those that can be mitigated but not reduced to a less-than-significant level. In addition, Code of Federal Regulations (CFR) Title 40 Section 1502.16 and Section 5.8.B (2) of the TRPA Code of Ordinances requires an EIS to include any significant adverse environmental effects which cannot be avoided should any of the alternatives be implemented. Table 4.1-1 presents a summary of significant environmental effects that cannot be avoided. Chapter 3 of this draft EIR/EIS/EIS addresses the potential environmental effects of the project alternatives for all applicable environmental topic areas and recommends mitigation measures, as necessary, to mitigate project effects to the extent feasible. Cumulative impacts of the project alternatives are discussed in Section 3.16, "Cumulative Impacts," of this draft EIR/EIS/EIS.

Table 4.1-1
Significant Environmental Effects that Cannot Be Avoided

Resource Topic/Impact	Alt	LOS[1] after Mitigation
Land Use		
None		
Hydrology and Flooding		
None		
Geomorphology and Water Quality		
3.4-6 Short-Term Risk of Surface Water or Groundwater Degradation during Construction.	2, 3, 4, & 5	SU
3.4-7 Short-Term Risk of Surface Water or Groundwater Degradation Following Construction.	2, 3, 4, & 5	SU
Biological Resources		
None		
Earth Resources		
None		
Scenic Resources		
None		
Recreation		
3.8-1 Reduction in Recreation Opportunities, Uses, and Experiences Related to Golf.	3 & 5	SU
Cultural Resources		
None		
Transportation, Parking, and Circulation		
None		

Table 4.1-1 Significant Environmental Effects that Cannot Be Avoided		
Resource Topic/Impact	Alt	LOS[1] after Mitigation
Air Quality		
None		
Noise		
None		
Public Services and Utilities		
None		
Human Health and Risk of Upset		
None		
Population and Housing, Socioeconomics, and Environmental Justice		
None		
Cumulative Impacts		
3.16-9 Cumulative Geomorphology and Water Quality – Short-Term Risk of Surface Water or Groundwater Degradation during Construction.	1 – 5	SU
3.16-10 Cumulative Geomorphology and Water Quality – Short-Term Risk of Surface Water or Groundwater Degradation Following Construction.	1 – 5	SU
Note: [1] LOS = Level of Significance after mitigation SU = Significant Unavoidable		

4.2 SIGNIFICANT AND IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Section 21100(b)(2)(B) states that an EIR shall analyze in a separate section significant and irreversible environmental changes. State CEQA Guidelines Section 15126.2(c) provides the following guidance for an analysis of significant and irreversible changes of a project:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

CFR Title 40 Section 1502.16 also states that an EIS shall analyze irreversible and irretrievable commitments of resources such as soils, wetlands, and waterfowl habitat. The irreversible and irretrievable commitment of resources is the permanent loss of resources for future or alternative purposes. These resources cannot be recovered or recycled or are consumed or reduced to unrecoverable forms. Implementation of all action alternatives–5 would have some irreversible and irretrievable commitment of resources.

As discussed in Chapter 2, "Project Alternatives," of this draft EIR/EIS/EIS, implementation of Alternative 2 would require reconfiguration of a portion of the Lake Tahoe Golf Course to allow for geomorphic restoration of the river, to reduce the area of stream environment zone (SEZ) occupied by the golf course, and to allow for establishment of a riparian habitat zone and buffer area between the golf course and the river. The project also involves a general plan amendment realigning the boundaries of Washoe Meadows State Park (SP) and Lake Valley State Recreation Area (SRA) so that restored habitat areas are within the state park and the reconfigured golf course holes are located entirely within the SRA. Implementation of Alternative 2 would, to some extent, commit future generations to the change in use of portions of the State Park and SRA.

Implementing Alternative 3 would commit future generations to the change in use of the SRA by modifying the type of play at the Lake Tahoe Golf Course. A reduced play golf course, such as an 18-hole executive or 9-hole regulation course, would be constructed on the east side of the river and would be designed to minimize the footprint of disturbed areas within the SEZ. All bridges would be removed. No construction would occur on the west side of the river in Washoe Meadows SP under Alternative 3 (Exhibit 2-8). A general plan amendment would be needed for Alternative 3 that would, to some extent, commit future generations to the change in use of portions of the State Park and SRA; changes in the boundaries between Washoe Meadows SP and Lake Valley SRA would be necessary to adjust the SRA boundary to fit the smaller golf course. In keeping with the respective purposes of Washoe Meadows SP and Lake Valley SRA, the boundary of Washoe Meadows SP would be adjusted (in this case, expanded) to encompass all of the restored river and riparian corridor.

Implementing the No Project/No Action Alternative or Alternative 4 would commit future generations to continue golf uses adjacent to the Upper Truckee River and Angora Creek, forgoing potential geomorphic restoration and instead continuing minor spot repairs to protect infrastructure or stabilizing the channel in place. Furthermore, implementing Alternative 4 would lock the river into its current disturbed configuration, not allowing for natural adjustment or processes and would commit future generations to maintain the stabilization infrastructure.

Implementing Alternative 5 would commit future generations to the change in use of the SRA to state park. Alternative 5 would involve restoring a portion of the river, decommissioning the entire 18-hole regulation Lake Tahoe Golf Course, and restoring the area once occupied by the golf course. Approximately 13,430 feet of the river and adjacent floodplain would be restored to geomorphic function as in Alternative 2 and 3, but more meadow area would be restored. All bridges would be removed, and there would be minor changes to trails. The restoration of the golf course would reestablish meadow and riparian habitats (Exhibit 2-12). The SRA would be reclassified as part of Washoe Meadows SP. State Parks would embark on a separate planning process to evaluate alternative uses of Washoe Meadows SP and Lake Valley SRA. The clubhouse and maintenance facilities would remain and their uses evaluated during this future process.

While the selection of one of the project alternatives would commit future generations to the approved uses, the commitment could be reversed in the future. The currently proposed project involves such a modification of use, i.e., from golf course to restored aquatic and riparian habitat or from forest and formerly disturbed quarry to golf course. Changes in use and/or restoration of natural resources in the state park units would be feasible, if future decisions by the state directed such changes. Therefore, the impacts on land use related to all of the action alternatives are not irreversible.

Implementation of Alternative 2 –5 would result in the irreversible and irretrievable commitment of energy and material resources during construction and operations. Energy would be expended in the form of gasoline, diesel fuel, and oil for equipment and transportation vehicles, and human labor. Building materials for the project would include rocks, sand, asphalt, concrete, sod, steel, and other materials. Construction activities would generate nonrecyclable materials, such as solid waste and construction debris. The use of these nonrenewable resources is expected to account for a small portion of the resources in the Tahoe Basin and their area of origin (generally, northern California and Nevada) and would not affect the availability of these resources for other needs within the basin.

4.3 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Chapter 5 of TRPA's Code of Ordinances and CFR Title 40 Section 1502.16 require a discussion of the relationship between a project's local short-term uses of the environment and the maintenance and enhancement of long-term productivity. The following discussion addresses how implementing the proposed project would affect the short-term use and the long-term productivity of the environment. In general, "short-term" is used here to refer to the construction period, and "long-term" refers to the operational life of the project and beyond.

The study area consists of the Lake Valley SRA, the southern portion of Washoe Meadows SP, and a small parcel of Conservancy property.

Implementation of Alternative 2–5 would result in short-term construction-related impacts in the study area. Impacts would include limiting recreational access of the area, local traffic and circulation interference, limited air emissions, water quality impacts, and increased ambient noise levels. These impacts would be temporary, occurring only during construction or during the interim adjustment period, and are not expected to alter the long-term productivity of the natural environment.

Implementing Alternative 2 would assist in the long-term productivity of the Lake Tahoe Golf Course while restoring the river and reducing sediment delivery to the lake, which would help to sustain and support the social and economic health of the South Lake Tahoe area by providing an improved 18-hole regulation golf course. The golf course would support seasonal tourism in the South Lake Tahoe area, which would provide an economic benefit to the Lake Tahoe business community and foster employee retention. In contrast, implementing Alternative 5 would result in an economic impact related to the loss of approximately $7.5 million in direct visitor spending and $0.5 million in tax revenue, for a total of $8.0 million annually (HEC 2008:63). Alternative 3 would result in reduced revenues between approximately $3.5 million and $5.2 million with a nontraditional golf course (HEC 2008:7). Because these revenues would be lost under Alternative 5 and decrease under Alternative 3, implementing the alternative would have an overall adverse economic impact on the community of South Lake Tahoe and would result in a decrease in the long-term productivity of the South Lake Tahoe area. Implementing Alternative 1 or 4 would result in long-term productivity similar to existing conditions.

4.4 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

CEQA Section 21100(b)(5) specifies that the growth-inducing impacts of a project must be addressed in an EIR. Section 15126.2(d) of the State CEQA Guidelines states that a proposed project alternative is growth inducing if it could "foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Direct growth inducement would result if a project involved, for example, the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises), involved a construction effort with substantial short-term employment opportunities that would indirectly stimulate the need for additional housing and services, or removed an obstacle to housing development. Examples of growth-inducing actions include developing water, wastewater, fire, or other types of service areas in areas not previously served; extending transportation routes into previously undeveloped areas; and establishing major new employment opportunities.

Growth would not be induced under any of the project alternatives because none of the project alternatives propose additional housing. In addition, implementing the project would not indirectly induce growth because none of the alternatives would result in substantial new permanent employment opportunities. Construction of Alternative 2–5 would generate short-term employment opportunities; however, the work would be temporary and would occur over several years, with certain activities starting and stopping for shorter durations within that time period. Because of the limited number and type of new jobs that would be generated and the temporary nature of those jobs, it is anticipated that the new jobs would be filled using the existing local employment pool. Existing available housing in the region would easily accommodate any workers who relocate from outside the area, if needed. As described in Chapter 2, “Project Alternatives,” of this draft EIR/EIS/EIS, the maximum increase in permanent employees under any alternative would be four additional employees. Therefore, the proposed project would require few permanent workers and would have little effect on the local workforce.

In addition, the proposed alternatives would not include any new services or utilities to the study area that would be constructed with more capacity than needed for uses currently being proposed, even with the proposed restroom facility under Alternatives 2 and 4. No road improvements are proposed as part of any alternatives. For these reasons, indirect growth-inducing impacts resulting from implementation of the proposed project would be less than significant.

As discussed in Section 3.15, “Population and Housing, Socioeconomics, and Environmental Justice,” a slight increase in economic growth may be realized under Alternative 2, which includes construction of an improved golf course. However, the increase in funding from implementation of Alternative 2 is expected to be minimal, resulting in no significant indirect growth-inducing effects. Implementation of Alternative 1, 3, 4, or 5 would result in either a reduction in economic growth or economic growth similar to existing conditions associated with the golf course.

4.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE/ENVIRONMENTALLY PREFERRED ALTERNATIVE

The action alternatives present trade-offs related to overall environmental advantages. Alternatives 2, 3, and 5 include geomorphic restoration of the river, which would create benefits for long-term water quality, amount and quality of aquatic and riparian habitat, and restoration of stream environment zone (SEZ). Alternative 4 would stabilize the river in place, and have some water quality and habitat benefits, although less than Alternatives 2, 3, and 5. Implementing the No Project/No Action Alternative would avoid the adverse impacts generated by construction activity and golf course reconfiguration resulting from the action alternatives; however, the water quality and river restoration benefits would not occur. Consequently, the No Project/No Action Alternative is not environmentally superior or environmentally preferred. Of the action alternatives, Alternative 5, River Ecosystem Restoration with Decommissioned Golf Course, is the environmentally superior alternative because it would:

- reduce the amount of land coverage the most among the alternatives, which would reduce soils, hydrologic, and biological impacts,
- restore the largest area of SEZ, and
- provide the long-term water quality and habitat benefits of geomorphic river restoration.

While Alternative 5 would be environmentally superior, it includes non-environmental trade-offs. The removal of the golf course would eliminate the revenue stream received by State Parks, a small number of existing local jobs, and the contribution of golfing activity to the local economy. Furthermore, State Parks would embark on a separate planning process to evaluate alternative uses of both Lake Valley State Recreation Area and Washoe Meadows SP.

4.6 CONSEQUENCES FOR ENVIRONMENTAL THRESHOLD CARRYING CAPACITIES

TRPA Threshold Carrying Capacities (thresholds) are standards of environmental quality to be achieved in the Tahoe Region. The standards identify the level of human impact the Lake Tahoe environment can take before irreparable damage occurs. There are nine resource areas for which thresholds have been established:

- soil conservation,
- water quality,
- fish habitat,
- vegetation,
- wildlife habitat,
- scenic resources,
- recreation,
- air quality, and
- noise.

The thresholds and indicators used to measure compliance of a project with TRPA Threshold Carrying Capacities were adopted in 1987 and remain in effect today. The analysis of attainment status (i.e., whether each threshold is being achieved and/or maintained) is updated approximately every 5 years and was most recently assessed in the 2006 Threshold Evaluation Report (TRPA 2007). Thresholds are under review at this time as part of the Pathways process to update the *Regional Plan for the Lake Tahoe Basin (Regional Plan)*.

An evaluation of the effects of each of the project alternatives on the thresholds is provided below for the nine resource areas that have applicable thresholds. For each threshold, it is stated whether the threshold is applicable to the proposed project and, if so, what the consequences of implementing each alternative would be on each applicable threshold. The evaluation of the project's effects on the threshold carrying capacities focuses on long-term changes in attainment. Short-term impacts associated with construction of each of the alternatives would be temporary and intermittent and would not change the attainment status of any of the threshold. Thresholds in "attainment," are those meeting the adopted TRPA standard, thresholds in "nonattainment" are not meeting the TRPA standard, and thresholds are designated as "unknown" when TRPA did not have adequate data to make a determination of attainment.

4.6.1 SOIL CONSERVATION

This section describes the effects of implementing each alternative on the thresholds established for soil conservation by TRPA. As described in Chapter 3, Section 3.3, "Hydrology and Flooding," and Section 3.6, "Earth Resources," two soil conservation thresholds have been established by TRPA:

- SC-1, Land Coverage (Impervious Cover), and
- SC-2, Stream Environment Zone.

The Tahoe Basin's status in 2006 was nonattainment for both SC-1 and SC-2. However, the 2006 Threshold Evaluation Report states, "There has been significant progress and an upward trend in the area of Soil Conservation" (TRPA 2007:9). The report indicates that the key cause for the nonattainment determination for SC-1 is unmitigated excess coverage associated with pre-1987 development (i.e., development that occurred before adoption of the 1987 Regional Plan). New projects must comply with TRPA's land capability classification requirements; therefore, the basin may be better described as being in "partial attainment" of SC-1 (TRPA 2007:9).

SC-1, LAND COVERAGE (IMPERVIOUS COVER)

Implementing Alternative 2, 3, or 5 would decrease coverage in the most sensitive lands (LCD 1b) adjacent to the Upper Truckee River, Angora Creek, and the unnamed creek, therefore decreasing existing land coverage of sensitive lands in the watershed. Alternative 4 would increase coverage within LCD 1b; however, proposed coverage is still within that allowed by TRPA. Because implementing any of the action alternatives would either contribute to attainment of the threshold by decreasing land coverage in sensitive lands (Alternatives 2, 3, and 5) or propose coverage that is consistent with TRPA requirements (Alternative 2 and 4), the action alternatives would be consistent with the threshold for land coverage.

SC-2, STREAM ENVIRONMENT ZONE

Attainment of the Stream Environment Zone threshold is tracked basinwide and tracked for three categories: naturally functioning SEZs; SEZs in undeveloped, unsubdivided lands; and SEZs in disturbed, developed, or subdivided areas. The SEZ threshold has a “nonattainment” status. Implementing the project would not adversely affect or interfere with attainment of the SEZ threshold.

Existing SEZ lands within the study area are in primarily disturbed areas with limited function. Implementing Alternative 1 or 4 would not restore SEZ lands that have been identified as disturbed, developed, or subdivided. Although implementing Alternative 4 would stabilize the river channel and prevent further channel erosion that continues to degrade or erode existing SEZ lands, it would not improve SEZ function.

Implementing Alternative 2, 3, or 5 would directly restore SEZ lands that have been identified as disturbed, developed, or subdivided, achieving restoration of 37, 43, and 123 acres of SEZ lands, respectively. Implementing any of these three alternatives would improve stream channel floodplain connectivity to allow overbanking more frequently, which would enlarge the active floodplain from 36 to 77 acres. In addition, implementing any of these three alternatives would modify land uses and include corrective actions within the disturbed SEZ. The remaining golf course footprint in SEZ would vary from 96 acres under Alternative 2 and 80 acres under Alternative 3 to 2.5 acres (continued use of structures) under Alternative 5. Corrective measures would be taken within the portions of SEZ no longer under golf course land uses, including removing nonnative landscaping and coverage, removing fill and reshaping the topography, amending disturbed soils, and replanting native vegetation.

The basinwide target for this threshold is to restore 1,100 acres (25 percent) of the 4,400 acres of SEZ lands identified as disturbed, developed, or subdivided. Approximately 378.9 acres have been restored since 1980, leaving 721.1 acres as the balance needed to attain the threshold. Implementing Alternative 5 would make a substantial contribution to attaining this threshold because it would restore 17.1 percent of the outstanding acreage balance. Implementing Alternative 2 or 3 also would make measureable contributions to attaining this threshold, restoring 5.1 and 6.0 percent of the outstanding acreage balance, respectively.

4.6.2 WATER QUALITY

This section describes the effects of implementing the different alternative on the environmental thresholds established for water quality by TRPA. As described in Section 3.4, “Geomorphology and Water Quality,” seven narrative and numeric standards for the adopted TRPA water quality thresholds have been established by TRPA:

- WQ-1, Littoral Lake Tahoe;
- WQ-2, Pelagic Lake Tahoe, Deep Water Clarity;
- WQ-3, Pelagic Lake Tahoe, Phytoplankton Primary Productivity;
- WQ-4, Tributaries;
- WQ-5, Stormwater Runoff, Surface Water;
- WQ-6, Stormwater Runoff, Groundwater; and
- WQ-7, Other Lakes.

None of the project alternatives would produce a discernable effect on four of the TRPA water quality thresholds: WQ-1, Littoral Lake Tahoe (attainment); WQ-2, Pelagic Lake Tahoe, Deep Water Clarity (nonattainment); WQ-3, Pelagic Lake Tahoe, Phytoplankton Primary Productivity (nonattainment); or, WQ-7, Other Lakes (nonattainment). Therefore, these thresholds are not discussed further.

Water Quality thresholds are applied basinwide; that is, the entire Tahoe Basin is considered in attainment or in nonattainment. However, spatial data by stream, lake, or other water body is tracked, and local attainment status is reported by TRPA. No spatially discrete targets have been established. The three directly related water quality thresholds all have a “nonattainment” status. Implementing the project would not adversely affect or interfere with attainment of any of TRPA’s seven water quality thresholds. The relevant thresholds are discussed in more detail below.

WQ-4, TRIBUTARIES

The TRPA threshold numeric standards that could be affected by the project include the attainment of State standards for concentrations of total nitrogen (0.15 to 0.22 milligrams per liter [mg/l]), total phosphorus (0.010 to 0.030 mg/l), and total iron (0.015 to 0.03mg/l) and attainment of a 90th percentile value for suspended sediment concentration of 60 mg/L (annual average). Most of the tributaries to Lake Tahoe, including the Upper Truckee River, are in attainment for suspended sediment concentration, based on monthly data through 2005 water year, but no California streams are in attainment for total nitrogen or total phosphorus.

Implementing Alternative 1 would not modify the sources and/or potential treatment (sinks) of suspended sediment, nitrogen, phosphorous, or iron within the study area, and it would not make a contribution toward attaining this threshold.

Implementing Alternative 2, 3, or 5 not only would reduce local sources of sediment from channel erosion but would enhance opportunities for treatment of suspended sediment, nitrogen, phosphorous, and iron within the study area. Reduced channel erosion and increased streambank vegetation would lower the total sediment and fine sediment generated and the release of nitrogen and phosphorous in the study area. Increased overbank flow frequency, the enlargement of the active floodplain, and the increased channel length of overbanking would foster substantial opportunities for floodplain deposition of fine sediment under Alternative 2, 3, or 5. Implementing any of these three alternatives would also restore varied areas of floodplain and SEZ vegetation and soil conditions. Improved opportunities for net sequestration of fine sediment and net uptake of nutrients would be expected to occur in proportion to the areas of restored soil and native vegetation. No discernable change in iron would be expected. These improvements to both source control and treatment would make substantial contributions toward attaining the water quality tributaries threshold. Implementing Alternative 5 would be expected to produce the largest benefit, although implementing either Alternative 2 or 3 would also make measurable contributions toward attaining this threshold.

Implementing Alternative 4 would not modify the potential treatment of suspended sediment, nitrogen, phosphorous, or iron within the study area, but it would substantially reduce local sources of sediment from channel erosion. Reducing the total sediment and fine sediment generated from channel erosion within the treatment reaches and improving channel bank vegetation could also lower the release of nitrogen and phosphorous as sources are reduced and uptake is encouraged. No discernable change in iron would be expected. Implementing Alternative 4 would result in source control that would make a measureable contribution toward attaining the water quality tributaries threshold. Alternative 4 would have more parking lot area paved, but would include BMP’s.

WQ-5, STORMWATER RUNOFF, SURFACE WATER

The Tahoe Basin is in nonattainment for standards focused on limiting nitrogen, phosphorous, iron, grease, oil and suspended sediment in stormwater surface water discharges.

Implementing Alternative 1 or 4 would not modify sources of nutrient, sediment, or hydrocarbon pollutants to stormwater within the study area, and it would not incorporate any modifications to the stormwater system or runoff treatment facilities. Implementing either of these alternatives would have no effect on the stormwater runoff-surface water threshold.

Implementing Alternative 2 would potentially increase the sources and/or modify the locations of nutrient, sediment, or hydrocarbon pollutants to stormwater within the study area. However, Alternative 2 would also involve incorporating upgrades to the stormwater drainage systems, relocating some of the source activities and materials further away from receiving waters, and installing and operating upgraded stormwater runoff pretreatment facilities. These measures would make a measureable contribution toward attainment of the stormwater runoff-surface water threshold.

Implementing Alternative 3 or 5 would decrease the sources and modify the locations of nutrient, sediment, or hydrocarbon pollutants within the study area, with improvements proportional to area of golf course land uses removed. Implementing Alternative 3 would retain some area of golf course, but would incorporate upgrades to the stormwater drainage system and would involve relocating some of the source activities further away from receiving waters. Implementing Alternative 5 would remove the golf course and, therefore, substantially decrease stormwater generated in the study area and sources of potential stormwater contaminants, thereby reducing the need for runoff pretreatment facilities. Implementing Alternative 3 or 5 would make substantial contributions toward attainment of the stormwater runoff-surface water threshold, with the expectation that implementing Alternative 5 would have a larger total benefit.

WQ-6, Stormwater Runoff, Groundwater

The Tahoe Basin is in nonattainment for standards focused on limiting nitrogen, phosphorous, iron, grease, oil, and turbidity in stormwater discharges for infiltration.

Implementing Alternative 1 or 4 would not modify sources of nutrient, sediment, or hydrocarbon pollutants to stormwater within the study area, and it would not incorporate any modifications to the stormwater system or runoff treatment facilities or to groundwater levels, flows, or recharge. Implementing either of these alternatives would have no effect on the stormwater runoff-groundwater threshold.

Implementing Alternative 2 would potentially increase the sources and modify the locations of nutrient, sediment, or hydrocarbon pollutants within the study area. However, Alternative 2 would also involve incorporating upgrades to the stormwater drainage systems, relocating some of the source activities and materials further away from receiving waters, and installing and operating upgraded stormwater runoff pretreatment facilities. Locations of potential changes in land use, drainage, and stormwater treatment would be closer to a few surface water-groundwater interface sites west of the river, but design measures and mitigation measures would be incorporated to limit surface runoff from recharging groundwater. The net effect of implementing Alternative 2 measures on attainment of the stormwater runoff-groundwater threshold would not be adverse but may not constitute a discernable benefit.

Implementing Alternative 3 or 5 would decrease the sources and modify the locations of nutrient, sediment, or hydrocarbon pollutants within the study area, with improvements proportional to area of golf course land uses removed. Implementing Alternative 3 would retain some area of golf course but would incorporate upgrades to the stormwater drainage system and would involve relocating some of the source activities further from surface water-groundwater interface locations. Alternative 5 would involve removing the golf course and, therefore, would substantially decrease stormwater generated in the study area and sources of potential stormwater contaminants, thereby reducing the need for runoff pretreatment facilities. Implementing either Alternative 3 or 5 would make substantial contributions toward attainment of the stormwater runoff-groundwater threshold, with the expectation that implementing Alternative 5 would have a larger total benefit.

4.6.3 FISH HABITAT

This section summarizes the effects of implementing each of the alternatives on the environmental thresholds established by TRPA for fish habitat. As described in Section 3.5, "Biological Resources," four fish habitat thresholds have been established by TRPA:

- F-1, Lake Habitat;
- F-2, Stream Habitat;
- F-3, Instream Flow; and
- F-4, Lahontan Cutthroat Trout.

F-1, LAKE HABITAT

The F-1 threshold is to apply a nondegradation standard to fish habitat in Lake Tahoe and achieve the equivalent of 5,948 total acres of excellent (prime) habitat. The current status of this threshold is nonattainment. Implementing Alternative 1 would not change fish habitat conditions in the lake; therefore, implementing this alternative would not affect nonattainment of the F-1 threshold. Implementing Alternative 2, 3, 4, or 5 would reduce suspended sediment loads to Lake Tahoe that originate from the study area. Therefore, implementing any of these alternatives would not contribute to nonattainment of the F-1 threshold.

F-2, STREAM HABITAT

The F-2 threshold is to "maintain 75 miles of excellent, 105 miles of good, and 38 miles of marginal stream habitat." The current status of this threshold is unknown because of lack of data (TRPA 2007). Implementing Alternative 1 would not change stream habitat conditions in the study area; therefore, implementing this alternative would not affect the attainment status of the F-2 threshold. Implementing Alternative 2, 3, 4, or 5 would improve stream habitat conditions in the Upper Truckee River to varying degrees and would contribute to the attainment of threshold F-2. Habitat in the segment of the Upper Truckee River within the study area would gradually change from "migratory marginal" to "migratory good" as the restoration project is completed and channel conditions improve.

F-3, INSTREAM FLOW

The F-3 threshold states that "until instream flow standards are established in the *Regional Plan* to protect fishery values, a nondegradation standard shall apply to instream flows." The current status of the threshold is attainment. Implementing any of the project alternatives would not change instream flows in the Upper Truckee River. Therefore, it would not affect the attainment status of the F-3 threshold.

F-4, LAHONTAN CUTTHROAT TROUT

The F-4 threshold is to "support, in response to justifiable evidence, State and Federal efforts to reintroduce Lahontan cutthroat trout." The current status of the threshold is attainment. Implementing Alternative 1 would not change habitat conditions for Lahontan cutthroat trout in the study area; therefore, implementing this alternative would not affect attainment of the F-4 threshold. Implementing Alternative 2, 3, 4, or 5 would improve stream habitat conditions in the Upper Truckee River to varying degrees for native fish species, including Lahontan cutthroat trout; therefore, it would contribute to further attainment of the F-4 threshold.

4.6.4 VEGETATION

This section summarizes the effects of implementing each of the alternatives on the environmental thresholds established by TRPA for vegetation. As described in Section 3.5, “Biological Resources,” four vegetation thresholds have been established by TRPA:

- V-1, Common Vegetation;
- V-2, Uncommon Plant Communities;
- V-3, Sensitive Plants; and
- V-4, Late Seral/Old Growth Ecosystems.

V-1, COMMON VEGETATION

The V-1 threshold is to increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern. The V-1 threshold includes separate standards for diversity and pattern of vegetation types and relative abundance for conifer forest types, meadow and wetland vegetation types, and deciduous riparian vegetation types that are applied basinwide.

In its *2006 Threshold Evaluation Report*, TRPA determined that the diversity and pattern standards for common vegetation were in attainment. Implementing any of the alternatives would not affect the attainment status of these thresholds, because none of the alternatives would affect the overall diversity or pattern of common vegetation types throughout the Tahoe Basin. To achieve the threshold for pattern across the basin, TRPA attempts to “provide for the proper juxtaposition of vegetation communities and age classes” partly by “limiting acreage size of new forest openings to no more than 8 acres” (TRPA 2007). Implementing Alternative 2 would result in the loss of up to 60 acres (includes17 acres of previously disturbed quarry lands, Jeffrey pine, lodgepole pine, and other common vegetation types) for golf course reconfiguration west of the Upper Truckee River. Although conversion to golf course would affect more than 8 acres, the existing forest cover that would be affected is patchy, disturbed, and relatively open. Furthermore, the final acres, number, and stand condition of trees removed will be determined in cooperation with TRPA prior to construction. The tree removal estimates for include trees that may be removed in the future for additional forest health and fuels treatments prior to, or in the absence of, project implementation, as part of State Parks’ existing Lake Sector Wildfire Management Plan. Although State Parks has treated much of the study area for fuels reduction, some proportion of trees estimated for removal may be removed in the future regardless of project implementation (Walck, pers. comm., 2010), to further reduce densities in some areas. Additionally, some lodgepole pines that would be removed within the riparian corridor as part of the geomorphic restoration would also be removed as part of State Parks’ existing management objectives to reduce conifer encroachment in riparian and meadow habitats and to enhance riparian hardwood growth (as part of the Riparian Hardwood Restoration Project). Therefore, loss of common vegetation under Alternative 2 would not contribute to nonattainment of the overall forest pattern threshold for the Tahoe Basin.

The threshold for relative abundance of Jeffrey pine forest is to maintain 15–25 percent of the Jeffrey pine forest in seral stages other than mature to ensure that relatively young age classes of this forest type are represented in the Tahoe Basin. In the *2006 Threshold Evaluation Report*, TRPA stated that “92% of Jeffrey pine have average stand diameters of less than 24 inches and therefore would be classified as stages other than mature.” (TRPA cites Nearctica [2000], which defines mature Jeffrey pine as ranging between 24 and 48 inches diameter at breast height [dbh].) However, the threshold evaluation report also states that attainment of this standard “cannot be well quantified with available metrics because ‘seral stages other than mature’ has not been defined with respect to this standard, and complete surveys of the demographics of Jeffrey pine forest types in the Basin have not been completed.” The report further explains that “the intent of the threshold as written was to increase the diversity of stand ages on the landscape and create more young stands. The diameter distribution [shown in Figure 5-1 of the report] illustrates that most stands contain large trees and there are few young stands on the landscape. Therefore, this threshold can be considered to be in nonattainment.” (Note: This conclusion appears to be based on the low proportion of stands that lack the presence of large trees, as opposed to the high proportion of stands with average tree diameters of less than 24 inches.) Whether the loss of variable-aged Jeffrey pine forest under Alternative 2 would affect attainment of the relative abundance threshold is not clear and would depend on how TRPA ultimately defines "seral stages other than mature." Based on TRPA's discussion (in the *2006 Threshold Evaluation Report*) of the intent of the relative abundance threshold, this analysis assumes that stands that "contain large trees" are excluded from the definition of "seral stages other than mature" (i.e., "seral stages other than mature" are generally limited to stands with relatively even age structure, dominated by small-diameter trees). The mixed-age stands of Jeffrey pine forest that would be affected under all action alternatives include large trees (including some greater than 30 inches dbh). Therefore, removal of this stand type would not affect TRPA's threshold to create or maintain young stands of Jeffrey pine on the landscape, and it would not contribute to further nonattainment of the relative abundance threshold.

Implementing Alternative 2, 3, or 5 would result in an increase in acreage and quality of deciduous riparian vegetation and meadow and wetland vegetation. Although the relative abundance threshold for these vegetation types is presently in nonattainment, implementing any of these alternatives would contribute to attainment of this threshold.

V-2, Uncommon Plant Communities

The V-2 threshold calls for providing the nondegradation of the natural qualities of any plant community that is uncommon to the Tahoe Basin or of exceptional scientific, ecological, or scenic quality. The spring/fen complexes in Washoe Meadows SP are examples of plant communities that are uncommon in the Tahoe Basin and are included under this threshold. None of the alternatives would contribute to nonattainment of this threshold. Construction activities would be conducted adjacent to the spring/fen complexes under Alternative 2, but avoidance and protection measures would ensure that these resources would not be degraded. None of the alternatives include any restoration activities at the spring/fen complexes that would bring this threshold closer to attainment.

V-3, Sensitive Plants

The V-3 threshold is to maintain the following minimum number of population sites for TRPA special-interest plant species: Galena Creek rockcress (*Arabis rigidissima* var. *demota*) (seven sites), long-petaled lewisia (*Lewisia longipetala*) (two sites), Cup Lake draba (*Draba asterophora* var. *macrocarpa*) (two sites), Tahoe draba (*Draba asterophora* var. *asterophora*) (five sites), and Tahoe yellow cress (*Rorippa subumbellata*) (26 sites). None of these special-interest plants has potential to occur within the study area. Under Alternatives 2, 3, 4, and 5, short-term disturbances or loss of other special-status plants that do have potential to occur within the study area would be avoided through preconstruction surveys and avoidance measures; therefore, suitable habitat for these species is expected to improve over the long term. For this reason, implementing any of these alternatives would not contribute to nonattainment of the V-3 threshold. Because habitat for TRPA special-interest plant species does not exist within the study area, project implementation under any of the alternatives would not result in any opportunity to contribute to attainment of this threshold.

As discussed in Impact 3.16-12 (All Alts.), "Cumulative Biological Resources – Effects on Special-Status Plants and Sensitive Habitats (Jurisdictional Wetlands, Riparian Vegetation, and SEZ)," any changes to beach erosion processes near the river mouth as a cumulative result of any project alternative could affect habitat for Tahoe yellow cress. However, after thorough investigation and given the distance between the study area and the mouth of the river, this impact remains too speculative for a meaningful conclusion regarding long-term effects on attainment status.

V-4, Late Seral/Old Growth Ecosystems

The study area does not contain any late seral/old growth forest. Implementing any of the five alternatives would not affect the attainment status of this threshold. Because of the long period over which late seral/old growth ecosystems develop, project implementation under any of the alternatives would not result in any opportunity to contribute to attainment of this threshold.

4.6.5 WILDLIFE HABITAT

This section summarizes the effects of each alternative on the environmental thresholds established by TRPA for wildlife habitat. As described in Section 3.5, “Biological Resources,” two wildlife habitat thresholds have been established by TRPA:

- W-1, Wildlife Species of Special Interest, and
- W-2, Habitats of Special Significance.

W-1, WILDLIFE SPECIES OF SPECIAL INTEREST

The W-1 threshold is to provide a minimum number of population sites for six TRPA special-interest wildlife taxa: northern goshawk (12 sites), osprey (four sites), bald eagle (two winter sites and one nesting site), golden eagle (four sites), peregrine falcon (two sites), and waterfowl (18 sites). Mule deer is also a special-interest species; however, no threshold site number for deer has been specified. None of the project alternatives would affect designated waterfowl threshold areas or breeding sites of other special-interest species. Therefore, implementing any of these alternatives would not affect the attainment status of the W-1 threshold. Under Alternatives 2, 3, 4, and 5, short-term disturbances or loss of nesting waterfowl would be avoided through preconstruction surveys and avoidance measures, and waterfowl habitat is expected to improve over the long term as a result of river and riparian habitat restoration.

W-2, HABITATS OF SPECIAL SIGNIFICANCE

The W-2 threshold is to apply a nondegradation standard to habitats consisting of deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations. These opportunities include but are not limited to preserving existing naturally functioning SEZ lands in their natural hydrologic condition; restoring all disturbed SEZ lands in undeveloped, unsubdivided lands; and restoring 25 percent of the SEZ lands that have been identified as disturbed, developed, or subdivided, to attain a 5-percent total increase in the naturally functioning SEZ land. River and floodplain restoration under Alternatives 2, 3, and 5would enhance the quality and increase the size of riparian, wetland, and aquatic habitat. Alternative 4, riverbank stabilization and inset floodplain creation would also enhance these habitats but less than Alternatives 2, 3, and 5. Therefore, implementing any of these alternatives would contribute to attainment of the W-2 threshold. Under Alternative 1, continued operation of the golf course would continue to limit riparian habitat functions along the Upper Truckee River but would not contribute to nonattainment of the W-2 threshold.

4.6.6 SCENIC RESOURCES

This section describes the effects of each alternative on the environmental thresholds established for scenic resources by TRPA. As described in Section 3.7, “Scenic Resources,” four scenic thresholds have been established by TRPA:

- SR-1, Travel Route Ratings;
- SR-2, Scenic Quality Ratings;
- SR-3, Public Recreation Area Scenic Quality Thresholds; and
- SR-4, Community Design.

SR-1, Travel Route Ratings

The only travel unit with views of the study area is Roadway Travel Unit 36B, which includes a portion of U.S. Highway 50 (U.S. 50). The 2006 Threshold Evaluation Report determined that this area is in attainment. Implementing any of the alternatives would not affect attainment of any scenic quality threshold. It would not adversely affect attainment of SR-1, Travel Route Ratings, because none of the alternatives would degrade views from Roadway Travel Unit 36B, and no new project facilities would be visible from this travel unit.

SR-2, Scenic Quality Ratings

SR-2, Scenic Quality Ratings, also would not be adversely affected by implementing any of the alternatives. Scenic resources identified in the project vicinity include views of the golf course (Roadway Scenic Resource 36-3), forest and river corridor views (Roadway Scenic Resource 36-7), and the Truckee River stream zone (Roadway Scenic Resource 36-5). Implementing Alternative 1, 2, 3, or 4 would result in little to no change in views of the golf course from U.S. 50 and would not affect any other identified scenic resources. Implementing Alternative 5 would result in changes in views of the golf course, which is identified as a scenic resource. Alternative 5 involves decommissioning the golf course and returning the area to restored meadow and riparian habitat. Although implementing this alternative would result in a substantial change in views of an identified scenic resource, the change in views from golf course to natural landscape is considered desirable and would be consistent with the surrounding natural landscape. The Tahoe Basin is known for its natural beauty, and changes in views from human-made features to natural meadow habitat are considered desirable.

SR-3, Public Recreation Area Scenic Quality Thresholds

TRPA's 1993 Lake Tahoe Scenic Resource Evaluation did not identify any TRPA-designated public recreation areas with views of the study area. Neither Lake Valley SRA nor Washoe Meadows SP is designated by TRPA as a public recreation area subject to these thresholds. The public recreation area nearest to the study area is Heavenly Valley Ski Resort. The study area is located approximately 7 miles from the ski resort. Based on this evaluation, the study area would not be visible from any TRPA-identified public campgrounds or segments of TRPA-identified bike trails. There is no current update to the 1993 scenic inventory. The Sawmill bike trail is considered a designated Class I Shared Use Path but has not been added to the list of scenic bikeways. Since the trail is immediately adjacent to U.S. Highway 50, scenic impacts on the bike path are addressed through scenic corridor impacts in Section 3.7, "Scenic Resources," where findings were less than significant. Therefore, no project alternatives would negatively affect SR-3, Public Recreation Area Scenic Quality Thresholds.

SR-4, Community Design

The community design threshold is a policy statement that applies to the built environment and is not restricted to roadways or shoreline units. Design standards and guidelines found in the Code of Ordinances, the Scenic Quality Improvement Program, and in the adopted Community Plans provide specific implementation direction. Alternatives 1, 3, and 5 do not propose any new development. Under Alternatives 2 and 4, additional lightning would be installed at the newly paved parking area adjacent to the golf course entrance. The golf course parking area lighting is currently used to light the parking areas for clubhouse events that may occur in the evening and end by 10 p.m. Lighting is not used to light the golf course, which is closed at dusk. Lighting use would continue to be for the purpose of lighting the parking area for specific events, ending at 10 p.m. According to the TRPA Design Review Guidelines lighting standards, lighting shall be directed downward, and lighting fixtures shall not exceed 10–12 feet in height (TRPA 1989a:30-5 and 30-6). All new lighting would comply with TRPA's Design Review Guidelines. In addition, the restroom facilities would be small, designed with natural colors to blend in with the surrounding landscape, blocked from view with strategically placed vegetative cover and constructed of nonreflective materials and would not include any exterior lighting. Because the new lighting would be near the existing parking area and clubhouse, which are existing sources of light and glare, and because the proposed lighting would be minimal and would be consistent with TRPA's lighting design guidelines, and restroom facilities would be designed to comply with TRPA's Design Review Guidelines and Alternatives 1, 3, and 5 do not propose any new development implementation of any of the alternatives would have no effect on SR-4 community design threshold.

4.6.7 RECREATION

This section describes the effects of each alternative on the environmental thresholds established for recreation resources by TRPA. As described in Section 3.8, "Recreation," two recreation thresholds have been established by TRPA:

- R-1, High Quality Recreational Experience & Access, and
- R-2, Capacity Available to the General Public.

R-1, HIGH QUALITY RECREATIONAL EXPERIENCE & ACCESS, AND R-2, CAPACITY AVAILABLE TO THE GENERAL PUBLIC

The R-1 threshold is intended to preserve and enhance the high-quality recreational experience by preserving high-quality, undeveloped shorezone and other natural areas. The R-2 threshold ensures that a fair share of the Tahoe Basin's capacity for outdoor recreation is available to the general public. TRPA's *2006 Threshold Evaluation Report* concluded that the R-1 and R-2 thresholds are considered to be in attainment (TRPA 2007:10-3, 10-8). Continuation of existing recreation opportunities in the study area would likely result in assignment of PAOTs under all alternatives. The Upper Truckee River Restoration and Golf Course Reconfiguration Project qualifies under the EIP for PAOT allocation from the existing pool (6,215 available for summer-day use and 7,927 available for winter-day use [TRPA 2007: 10-9]) available for the Golf Course and for the driving range snowmobile uses.

Under Alternative 1, existing recreational opportunities or capacities would not change. Therefore, implementing Alternative 1 would not cause any changes to the existing threshold attainment status.

Alternative 2 would involve reconfiguring the Lake Tahoe Golf Course. Some volunteer trails within Washoe Meadows SP would be removed under this alternative; however, new trails would be added to provide access around the reconfigured golf course. Although reconfiguring the golf course would result in a reduction in dispersed outdoor recreation within a portion of Washoe Meadows SP and a reduction in public access to natural areas, the recreation opportunities that would be reduced would be replaced with other trail and river recreation opportunities in the restored river corridor. Furthermore, connectors to the Sawmill bike trail would increase connectivity to the existing bike trail.

Although the locations of recreation opportunities within a portion of the study area would change, recreation opportunities provided in the study area as a whole would not substantially change. Currently, no PAOTs are assigned to recreational facilities within the study area. Therefore, Alternative 2 would not have an adverse effect on PAOT capacity for the study area or Tahoe Basin. Implementing Alternative 2 would not cause changes to the attainment status of the R-1 and R-2 thresholds.

Alternative 3 would involve substantially modifying the existing golf course in the study area. The golf course would be modified to a regulation 9-hole course or an 18-hole executive course. Although Alternative 3 would not include a regulation-level golf course, implementing this alternative would still provide high-quality recreation. The changes to the golf course would allow restoration of the Upper Truckee River, which would enhance and preserve a natural area. Alternative 3 would involve reducing access across the river; however, some access would be maintained via a new trail system that would also provide connectivity to the Sawmill bike trail. In addition, no PAOTs have been assigned to the golf course or other recreational facilities within the study area. Therefore, although the reduced golf course would result in slightly less golfing opportunities, it would not result in a loss of PAOTs. Because PAOTs have not been assigned to the golf course, this alternative would not reduce recreation PAOT capacity. Because high-quality recreation and access to natural areas would remain available in the study area, implementing this alternative would not alter the attainment status of the R-1 and R-2 thresholds.

Implementing Alternative 4 would not result in impacts on existing recreation opportunities. This alternative would not involve substantial changes to the Lake Valley SRA or Washoe Meadows SP. Only minor changes would be made to the golf course, and they would not alter the existing golfing or winter recreational opportunities or experiences, or reduce PAOT capacity. Therefore, implementing Alternative 4 would not cause changes to the existing attainment status of the R-1 and R-2 thresholds.

Alternative 5 would involve substantially modifying existing recreation facilities in the study area. The existing golf course would be decommissioned. A 9-hole course may be developed in the short term until future planning efforts determine uses and development of Washoe Meadows SP and Lake Valley SRA could. The changes to the golf course would allow restoration of the Upper Truckee River and the entire footprint of the golf course, which would enhance and preserve a natural area. Existing informal trails would remain in place, except in locations where restoration is proposed to occur. The less intensive recreational resources, such as hiking/walking, nature/wildlife viewing, biking, and equestrian use, would remain available to the general public. In addition, water-related recreation would continue informally under Alterative 5. No PAOTs have been assigned to the golf course or other recreational facilities within the study area. Therefore, although eliminating the golf course and snowmobile track would result in reduced recreation opportunities within the study area, there would not be a loss of PAOTs or a reduction in PAOT capacity. Thus, Alternative 5 would not cause changes to the existing attainment status of the R-1 and R-2 thresholds.

4.6.8 AIR QUALITY

This section describes the effects of each alternative on the environmental thresholds established for air quality by TRPA. As described in Section 3.11, “Air Quality,” eight air quality thresholds have been established by TRPA:

- AQ-1, Carbon Monoxide;
- AQ-2, Ozone (ROG and NO_X);
- AQ-3, PM_{10};
- AQ-4, Visibility;
- AQ-5, U.S. 50 Traffic Volumes;
- AQ-6, Wood Smoke Emissions;
- AQ-7, Vehicle Miles Traveled; and
- AQ-8, Atmospheric Nutrient Loading.

AQ-1, CARBON MONOXIDE, AQ-2, OZONE (ROG AND NO_X), AQ-3, PM_{10}, AQ-4, VISIBILITY, AND AQ-8, ATMOSPHERIC NUTRIENT LOADING

Air quality thresholds are applied basinwide; that is, the entire basin is considered in attainment or in nonattainment. No local attainment designations are used. The AQ-1, AQ-2, and AQ-3, thresholds have been designated “nonattainment”; the AQ-4 threshold has been designated “attainment”; and the AQ-8 threshold has been designated “unknown.” The thresholds for air quality are established by TRPA for long-term operational emissions only. Therefore, temporary, short-term, construction-related emissions are not considered in determining compliance with TRPA thresholds.

Implementing Alternative 1 would not create any new sources of carbon monoxide (CO), reactive organic gases (ROG), oxides of nitrogen (NO_X), respirable particulate matter (PM_{10}), or trip generation (see Chapter 3, Section 3.11, “Air Quality,” for discussion). As a result, attainment of thresholds AQ-1, AQ-2, AQ-3, and AQ-8 would not be affected by implementing Alternative 1. In addition, because no increase in ozone (ROG and NO_X) and PM_{10} emissions would occur, attainment of threshold AQ-4 would not be affected under Alternative 1.

Implementing Alternative 2, 3, 4, or 5 would not exceed any long-term operational emissions thresholds set by TRPA or increase trip generation or vehicle miles traveled (VMT). Thus, long-term operational emissions of CO or criteria air pollutants (ozone [ROG and NO_X] and PM_{10}) would not violate the air quality standards established by thresholds AQ-1, AQ-2 or AQ-3. Because thresholds AQ-4 and AQ-8 are based on the formation of criteria air pollutants regulated under thresholds AQ-2 and AQ-3 (e.g., visibility: ozone and PM_{10}; atmospheric nutrient loading: NO_X), they also would not be violated by long-term project operation.

AQ-5, U.S. 50 Traffic Volumes and AQ-7, Vehicle Miles Traveled

The AQ-5 threshold has been designated “attainment,” and AQ-7 threshold has been designated “nonattainment.” No substantial increase in trip generation would occur from implementing Alternative 1, and there would be no long-term increases in NO_X; therefore, attainment of thresholds AQ-5 and AQ-8 would not be affected by implementing Alternative 1.

None of the action alternatives would cause long-term level of service (LOS) levels to deteriorate at any intersection or route, including U.S. 50. Thus, long-term operational (local) emissions of CO by mobile sources and resulting changes in LOS levels (i.e., U.S. 50 traffic volumes) related to the project would not violate the air quality standards established by threshold AQ-5. In addition, basinwide VMT would not increase under any of the action alternatives; thus, threshold AQ-7 would not violated by long-term project operations.

AQ-6, Wood Smoke Emissions

The AQ-6 threshold has been designated “unknown.” Because no increase in prescribed burning or other wood smoke sources would occur with implementation of any of the alternatives, attainment of threshold AQ-6 would not be affected.

4.6.9 Noise

This section describes the effects of each alternative on the environmental thresholds established for noise by TRPA. As described in Section 3.12, “Noise,” three noise thresholds have been established by TRPA:

- N-1, Aircraft Noise;
- N-2, Single Event Noise; and
- N-3, Community Noise Equivalent Levels.

Noise thresholds are applied basinwide, and no local attainment designations are used. The three noise thresholds have a “nonattainment” status. The project would not adversely affect or interfere with attainment of any of TRPA’s noise thresholds.

N-1, Aircraft Noise

Implementing Alternative 1, 2, 3, 4, or 5 would not affect N-1, Aircraft Noise, because none of the alternatives would have an impact on aircraft operations.

N-2, Single Event Noise

Implementing Alternative 1, 2, 3, 4, or 5 would not affect attainment of N-2, Single Event Noise, as defined in the TRPA Environmental Threshold Carrying Capacity Noise Standards, because single-event noise from haul trucks would not exceed 82 A-weighted decibels (dBA) maximum noise level (L_{max}) at 50 feet (see Tables 3.12-2 and 3.12-10), and no other single-event noise sources would be created or modified.

N-3, COMMUNITY NOISE EQUIVALENT LEVELS

Implementing Alternative 1, 2, 3, 4, or 5 would have a less-than-significant impact on short-term and long-term noise levels, as described in Section 3.12, “Noise.” Implementing any of the alternatives would not affect attainment of threshold N-3, Community Noise Equivalent Levels (CNEL). Implementing the project would increase noise levels in the short term because construction equipment would be involved in restoration activities and reconfiguration of the golf course, and in the long term, noise levels would vary depending on the alternative implemented; however, both traffic and area noise sources would be unchanged (Alternative 1), would not increase substantially (Alternative 2), would remain similar to existing levels (Alternatives 3 and 4), or would be reduced (Alternative 5). Construction noise is exempt under the TRPA Code of Ordinances. Operational noise would be insufficient to cause perceptible noise increases at nearby sensitive receptors and thus would not increase CNELs sufficiently to adversely affect or interfere with attainment of community noise thresholds established by TRPA (Table 3.12-3). Implementing Alternative 2, which would involve reconfiguring golf holes west of the river, would result in the greatest change to CNEL in the study area and surrounding residential areas. The CNEL under Alternative 2 is estimated to increase by 1.3 dBA CNEL, to 44.6 dBA CNEL in the area west of the river, which is below the minimum perceptible increase and well within the TRPA threshold of 50 dBA CNEL for low-density residential and rural outdoor recreation uses. For Alternative 2, 3, or 4, CNEL is not estimated to substantially change because existing land uses would continue at similar levels of intensity and in approximately the same location as existing conditions (or in smaller areas, as is the case for golf activity under Alternative 3). Under Alternative 5, overall CNEL noise levels would be reduced because traffic related to golf course employees and patronage and related to golf course maintenance activities would be eliminated. Therefore, changes to the existing attainment status of any of the noise thresholds would not occur under any of the alternatives.

5 COMPLIANCE WITH APPLICABLE FEDERAL LAWS AND EXECUTIVE ORDERS AND STATE LAWS AND REGULATIONS

This environmental impact report/environmental impact statement/environmental impact statement (EIR/EIS/EIS) presents a thorough evaluation of the project alternatives, in accordance with the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Tahoe Regional Planning Agency (TRPA) requirements. This chapter describes the proposed project's compliance with applicable Federal statutes and executive orders and State statutes and regulations additional to NEPA, CEQA, and TRPA environmental review provisions. Regulatory settings that discuss applicable Federal, State, and local laws and regulations are also included in each of the resource sections (see Chapter 3, "Affected Environment and Environmental Consequences").

5.1 FEDERAL STATUTES AND REGULATIONS

5.1.1 FEDERAL ENDANGERED SPECIES ACT OF 1973, AS AMENDED (PL 93-205, 87 STAT. 884, 16 USC SECTION 1531 ET. SEQ.)

The Federal Endangered Species Act protects threatened and endangered species, as listed by U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), from unauthorized take, and directs federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 of the Act defines federal agency responsibilities for consultation with USFWS and requires preparation of a Biological Assessment to identify any threatened or endangered species that are likely to be affected by the proposed project. State Parks, TRPA, and Reclamation have coordinated with USFWS and NMFS regarding potential project effects on federally listed species. As discussed in Section 3.5, "Biological Resources," EDAW (now AECOM), on behalf of State Parks, TRPA, and Reclamation, has conducted surveys for endangered and threatened species, and has determined that the proposed project would not affect any Federally listed species. Therefore, consultation with FWS and NMFS is not necessary.

5.1.2 FISH AND WILDLIFE COORDINATION ACT (16 U.S.C. SEC 661)

The Fish and Wildlife Coordination Act (FWCA), as amended, proposes to assure that fish and wildlife resources receive equal consideration with other values during the planning of water resources development projects. The FWCA was passed because the goals of water-related projects (e.g., flood control, irrigation, navigation, hydroelectric power) may conflict with the goal of conserving fish and wildlife resources (DOE 2004). As discussed in Section 3.5, "Biological Resources," impacts to fish and wildlife are less than significant or would be mitigated with measure such as conducting pre-construction surveys to avoid the loss of individuals, nests, or roost sites, developing and implementing a native fish and mussel capture and translocation plan, implementing vegetation protection measures and revegetate disturbed areas, and minimizing tree removal, and developing a tree removal and management plan. The U.S. Fish and Wildlife Service has been sent a copy of the draft EIR/EIS/EIS for review and comment to facilitate consultation on fish and wildlife issues.

5.1.3 MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, domestically implements a series of international treaties that provide protection for migratory birds. It authorizes the Secretary of the Interior to regulate the taking of migratory birds and provides that it shall be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird (16 USC 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species, which essentially comprises all native birds. As discussed in Section 3.5, “Biological Resources,” adverse impacts to birds would be mitigated by conducting pre-construction surveys for individuals, nests, and roost sites of bird species and, to the extent reasonable and feasible, avoid the loss of by limiting the operating periods to avoid nesting seasons or modifying the project design, if necessary, to avoid removal of occupied habitat while still achieving project objectives. Also, with the completion of riparian and meadow habitat restoration in the action alternatives, habitat quality for birds would be improved. Because the adverse impacts of the proposed project on birds would be mitigated and the outcome of the restoration component of the project on habitat quality for birds would be beneficial in the long-term, the project would include all reasonable and feasible measures to protect migratory birds.

5.1.4 BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act, enacted in 1940 and amended multiple times since, prohibits the taking of bald and golden eagles without a permit from the Secretary of the Interior. Similar to the ESA, the Bald and Golden Eagle Protection Act defines “take” to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” (16 USC 668-668c). For the purpose of the Act, disturbance that would injure an eagle, decrease productivity, or cause nest abandonment, including habitat alterations that could have these results, are considered take and can result in civil or criminal penalties. As discussed in Section 3.5, “Biological Resources,” bald eagle and golden eagle do not nest in the study area. It was determined that the proposed project would not likely affect these species. Therefore, a permit is not needed for the proposed project. The proposed project would comply with the Bald and Golden Eagle Protection Act.

5.1.5 FEDERAL WATER POLLUTION CONTROL ACT (COMMONLY REFERRED TO AS THE CLEAN WATER ACT) OF 1977 33 U.S.C. 1251 ET. SEQ.)

The Clean Water Act (CWA) provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation’s waters. Section 404 of the CWA requires projects to receive authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), to discharge dredged or fill material into waters of the United States, including wetlands, whether the discharge is temporary or permanent. USACE Regional General Permit 16 authorizes activities with minimal individual and cumulative impacts on waters of the United States, including wetlands, in the Tahoe Basin. Ecosystem restoration is an activity covered by Regional General Permit 16. In conjunction with USACE’s CWA Section 404 permits, CWA Section 401 requires that water quality certifications or waivers be issued by the U.S. Environmental Protection Agency (EPA), the states, or both.CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate discharges of pollutants into waters of the United States. A NPDES permit sets specific discharge limits for point sources discharging pollutants into waters of the United States and establishes monitoring and reporting requirements, as well as special conditions. Discharges of stormwater to surface waters associated with construction activity including clearing, grading, and excavation activities mush also obtain an NPDES permit and implement measures to reduce or eliminate stormwater pollution. The Federal government delegates water pollution control authority under Section 402 of the CWA to the states and the states oversee compliance. As discussed in Sections 3.4, “Geomorphology and Water Quality” it is anticipated that State Parks will seek an exemption for potential violations of turbidity standards during the NPDES permit process through the Lahontan RWQCB and potential impacts to beneficial uses will be mitigated. Furthermore, a wetland delineation will be prepared for the proposed project after a preferred alternative is selected and a Regional General Permit 16 will be obtained prior to construction. Because the project would identify the location of sensitive habitats, minimize impacts, receive an exemption for violation of turbidity standards, and compensate for any losses through the permit process, it would comply with the CWA.

5.1.6 FEDERAL CLEAN AIR ACT

The Federal Clean Air Act (CAA) was enacted to protect and enhance the nation's air quality to promote public health and welfare and the productive capacity of the nation's population. The CAA requires an evaluation of any Federal action to determine its potential impact on air quality in the project region. California has a corresponding law, which also must be considered during the EIR/EIS/EIS process. As discussed in Section 3.11, "Air Quality," long-term effects of the proposed project on air quality would be less than significant. Because the effects of the proposed project on air quality have been evaluated and mitigated to the extent possible, the proposed project would comply with the CAA.

5.1.7 SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED (PL 89-665, 80 STAT. 915, 16 U.S.C. SECTION 470 ET. SEQ. AND 36 CFR 18, 60, 61, 63, 68, 79, 800)

The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places (NRHP). The Advisory Council on Historic Preservation has developed implementing regulation (36 CFR 800), which allows agencies to develop agreements for consideration of these historic properties. In accordance with Section 106 requirements, the Washoe Tribe of Nevada and California was contacted regarding the proposed project, surveys have been conducted to identify historic properties and evaluate their eligibility for inclusion in the NRHP, and conditions have been proposed to resolve all potential adverse effects on the eligible resources.

Studies of the area of potential effect and consultation with the Washoe Tribe and the California State Historic Preservation Officer determined that four prehistoric cultural resources have been documented within the study area that could be affected by the proposed alternatives. These include sites showing evidence of early Native American occupation and retain integrity and data potential; rendering them eligible for NRHP listing under Criterion d. A representative of the Washoe Tribe has been involved in reviewing previous study findings, the results of the archival and field research, and conditions for preservation designed to reduce potential impacts on cultural resources. The State Historic Preservation Officer (SHPO) will be sent the draft EIR/EIS/EIS for use in consultation between Reclamation and SHPO to confirm that no adverse effect would occur to resources that are listed in or eligible to the NRHP. For these reasons, the project would comply with Section 106 of the National Historic Preservation Act.

5.1.8 INDIAN TRUST ASSETS

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Native American tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of trust assets include lands, minerals, hunting and fishing rights, and water rights. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Native American tribes or individuals by treaties, statutes, and executive orders. This duty, founded in law and restated in Departmental policy, requires Reclamation to carry out its activities in a manner that avoids adverse impacts to ITAs when possible. When adverse impacts cannot be avoided, appropriate mitigation or compensation will be provided. Tribal lands ITAs consist of lands that have been deeded to tribes or upon which tribes have a historical legal claim. However, there are no such lands within or in the immediate vicinity of the project vicinity and, for this reason, it was determined that the proposed project would have no impact on ITAs. Because ITAs have been evaluated and the project would have no impact on these resources, the proposed project would comply with ITAs.

5.1.9 FARMLAND PROTECTION POLICY

The Farmland Protection Policy Act of 1981 requires federal agencies to include in an EIS an assessment of effects on farmlands, which is required to focus on minimizing adverse impacts on prime and unique farmlands.

Agricultural lands at and in the project vicinity are limited to timberlands. As discussed in Chapter 1, "Introduction," the study area is located on State property not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance and is not under Williamson Act contract. However, as discussed in Section 3.5, "Biological Resources," the study area contains a Sierra mixed conifer forest vegetation community and the proposed project would require substantial tree removal from the study area related to the golf course reconfiguration. Potentially significant tree removal impacts would be reduced to less-than-significant levels with preparation of a Tree Removal and Management Plan or Timber Harvesting Plan. In addition, the timberlands within the study area are not considered prime and unique farmlands in accordance with the Farmland Protection Policy Act, and as such, the project would not result in loss of farmland acreage. Because no impacts on farmland have been identified, the proposed project would comply with the Farmland Protection Policy.

5.1.10 EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

This Executive Order requires federal agencies to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains, and to avoid development in floodplains whenever there is a practical alternative. If a project alternative is found to be in the applicable regulatory floodplain, State Parks shall prepare a floodplain assessment, known as a Statement of Findings. Implementing Alternatives 2, 3, and 5 would directly modify the size and configuration of the Upper Truckee River channel within the study area, which could allow the water surface elevation for the 100-year flood to increase or the boundary of the 100-year floodplain to expand. The expanded floodplain would be contained within open space areas and not include any residential areas. Alternative 2 would also include a new bridge that would span the floodplain and would replace existing smaller bridges. Alternatives 3 and 5 would remove bridges and not have replacement bridges. Alternative 4 would remove two bridges and replace them with one longer span bridge. In addition, implementation of any of the action alternatives would provide on-site storm drainage facilities and accompanying stormwater drainage plan to prevent damage from increased runoff discharged to creek or river channels to mitigate impacts on the Upper Truckee River hydrology and floodplain function related to increased stormwater runoff volumes. Because an increase in flood elevation and/or floodplain would occur under Alternatives 2, 3, and 5 mitigation has been developed to accurately model the hydraulics of the proposed channel configuration to be used iteratively to identify and incorporate modifications to final design that would prevent increases in the future 100-year water surface elevation or inundation area as needed to prevent an increase flood hazards or potential damage to existing structures, residences, or public infrastructure. Because, either there would be no effect on the flood elevation or the project's effects would be mitigated, all alternatives comply with Executive Order 11988.

5.1.11 EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS)

This Executive Order established the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. As discussed in Sections 3.4 "Geomorphology and Water Quality" and 3.5, "Biological Resources," a wetland delineation will be prepared for the proposed project after a preferred alternative is selected and a USACE Section 404 permit will be obtained prior to construction. Because the project would identify the location of sensitive habitats by conducting a wetland delineation, avoid and minimize impacts by ensuring the final design of golf course holes avoid the southernmost spring complex, erecting protective fencing around the spring complex to protect it from project-related effects, and complying with all of the terms of the Regional General Permit 16 for the construction of all aspects of the project, and compensate for any losses, it would mitigate impacts on wetlands. In addition, implementing any of the action alternatives would result in a net increase in the amount of wetlands in the study area. Therefore, the proposed project would comply with Section 404 of the Executive Order 11990.

5.1.12 EXECUTIVE ORDER 12898 (ENVIRONMENTAL JUSTICE)

This Executive Order requires that federal agencies ensure that their actions do not disproportionately affect minority and disadvantaged populations or communities with adverse human health effects or environmental effects. As discussed in Section 3.15, "Population and Housing, Socioeconomics, and Environmental Justice," the project would have no significant long-term or short-term disproportionate adverse impacts on low-income or minority populations. Because the proposed project has evaluated environmental justice and there would be no impacts, the project would comply with Executive Order 12898.

5.1.13 EXECUTIVE ORDER 13007 (INDIAN SACRED SITES) AND APRIL 29, 1994, EXECUTIVE MEMORANDUM

Executive Order 13007 (May 24, 1996) requires federal agencies with land management responsibilities to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. Among other things, federal agencies must provide reasonable notice of proposed actions or land management policies that may restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites. As described in Section 3.9, "Cultural Resources," cultural resource investigations for the project consisted of a phased approach that included Native American consultation, prefield research, field reconnaissance surveys, and resource documentation. Based on the investigations, it was determined no Indian Sacred Sites are located within the study area or project vicinity. Therefore, the project would have no effect on any Indian Sacred Sites. Because the proposed project has evaluated Indian Sacred Sites in the study area and there would be no impacts, the project would comply with Executive Order 13007.

5.2 STATE STATUTES AND REGULATIONS

5.2.1 CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act expanded upon the original plant protection act and enhanced legal protection for plants and wildlife. The California Endangered Species Act parallels the policies of the Federal Endangered Species Act. The state legislation was written to protect state endangered and threatened plant and animal species whose continued existence in California is in jeopardy. The California Endangered Species Act and Sections 2050 and 2097 of the Fish and Game Code prohibit "take" of plant and animal species designated by the California Fish and Game Commission as either endangered or threatened. As discussed in Section 3.5, "Biological Resources," evaluations have been conducted for State-listed endangered and threatened species, and have determined that the proposed project would not likely affect any State listed species. Therefore, a take permit is not needed for the proposed project. Because surveys have been conducted and effects to listed species would be avoided, the proposed project would comply with the California Endangered Species Act.

5.2.2 FISH AND GAME CODE SECTION 1602

Section 1602 of the Fish and Game Code requires a streambed alteration agreement to be granted prior to any action that may divert or obstruct the natural channel flow, substantially change the bed, channel, or bank of any river, stream, or lake designated by California Department of Fish and Game (CDFG), or use any material from the streambed of a CDFG designated waterway. As discussed in Section 3.5, "Biological Resources," implementation of the proposed project will require a streambed alteration agreement from CDFG for work on the bed and banks of the Upper Truckee River. State Parks shall obtain the streambed alteration agreement from CDFG and implement all terms required for permit compliance. Therefore, the project would be in compliance with Fish and Game Code Section 1602.

5.2.3 CALIFORNIA SCENIC HIGHWAY PROGRAM

California's Scenic Highway Program was created by the California State Legislature in 1963 and is managed by the California Department of Transportation (Caltrans). The goal of this program is to preserve and protect scenic highway corridors from changes that would affect the aesthetic value of the land adjacent to highways. A highway may be designated "scenic" depending on how much of the natural landscape travelers can see, the scenic quality of the landscape, and the extent to which development intrudes on travelers' enjoyment of the view. Official designation requires a local jurisdiction to enact a scenic corridor protection program that protects and enhances scenic resources (Caltrans 2005). As discussed in Section 3.7, "Scenic Resources," U.S. 50, which is visible from the study area, is officially designated as a scenic highway; however, the proposed project would have no significant effects on views from U.S. 50. Because the impacts of the proposed project on scenic highways have been evaluated and the project would not have any significant adverse effects, the project would comply with the California Scenic Highway Program.

5.2.3 STATE HISTORIC PRESERVATION PROGRAM

When a project will affect state-owned historical resources, as described in Public Resources Code Section 5024, and the lead agency is a state agency, the lead agency shall consult with the State Historic Preservation Officer as provided in Public Resources Code Section 5024.5. Consultation should be coordinated in a timely fashion with the preparation of environmental documents.

Only significant cultural resources (e.g., "historical resources" and "unique archaeological resources") need to be addressed. The State CEQA Guidelines define a historical resource as, among other things, "a resource listed or eligible for listing on the California Register of Historical Resources" (CRHR) (State CEQA Guidelines, Section 15064.5[a][1]; see also Sections 5024.1 and 21084.1 of the California Public Resources Code. A historical resource may be eligible for inclusion in the CRHR, as determined by the State Historical Resources Commission or the lead agency, if the resource:

- is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- is associated with the lives of persons important in our past;
- embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- has yielded, or may be likely to yield, information important in prehistory or history.

As described in Section 3.9, "Cultural Resources" State Parks prepared and submitted a findings of effect to the State Historic Preservation Officer. Any historic property treatment plans related to the project will be submitted and approved by the State Historic Preservation Officer; therefore, the proposed alternatives would comply with Public Resources Code Section 5024.5.

5.2.4 PORTER-COLOGNE WATER QUALITY CONTROL ACT (CALIFORNIA WATER CODE SECTION 13000 ET SEQ.)

The study area is under the jurisdiction of the Lahontan RWQCB. The Lahontan RWQCB administers CWA Section 401 water quality certifications in conjunction with USACE's CWA Section 404 permit. In addition, the Lahontan RWQCB regulates discharge of stormwater from construction projects (as well as municipal and industrial stormwater) under the CWA Section 402 NPDES permit program. Because the project would disturb more than 1 acre of land, State Parks would need to obtain and comply with the Lahontan RWQCB's NPDES General Permit Number CAG616002 for discharge of stormwater runoff associated with construction activity.

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) requires establishment of water quality objectives and standards to protect water quality for beneficial uses. This act is implemented by the State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs), which are responsible for preserving California's water quality. The SWRCB protects water quality by setting Statewide policy, coordinating and supporting RWQCB efforts, and reviewing petitions that contest RWQCB actions. The RWQCBs issue waste discharge permits, take enforcement action against violators, and monitor water quality for the protection of waters in their specified regions. The SWRCB and the RWQCBs jointly administer Federal and State laws related to water quality in coordination with EPA and USACE.

As discussed in Sections 3.4, "Geomorphology and Water Quality" it is anticipated that State Parks will seek an exemption for potential violations of turbidity standards during the NPDES permit process through the Lahontan RWQCB and potential impacts to beneficial uses will be mitigated. Because the project would identify the location of sensitive habitats, minimize impacts, receive an exemption for violation of turbidity standards, and compensate for any losses through the permit process, it would comply with Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.).

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6 LIST OF PREPARERS

California Department of Parks and Recreation

Cyndie Walck .... Project Manager/Hydrologist/Geomorphologist
Dan Shaw .... Ecologist
Nathan Shasha .... GIS
Curtis Grey .... GIS
Tamara Sasaki .... Botanist
Lisa Fields .... Wildlife Biologist
Denise Jaffke .... Archaeologist

Tahoe Regional Planning Agency

Michael Elam .... Project Manager

U.S. Bureau of Reclamation

Myrnie Mayville .... Tahoe Program Manager

AECOM—Primary Consultant

Steve Heipel .... Principal-in-Charge
Danielle Hughes .... Project Manager
Deb Vreeland .... Project Manager
Nanette Hansel .... Project Manager
Stephanie Rasmussen .... Assistant Project Manager/Analyst
Patricia Hickson .... Assistant Project Manager/Analyst
Jenifer King .... Environmental Analyst
Kendra Ryan .... Environmental Analyst
Chris Fitzer .... Fisheries Biologist
Brian Ludwig .... Archeologist
Honey Walters .... Senior Air Quality and Noise Analyst
Jake Weirich .... Air Quality and Noise Specialist
Steve Henderson .... Senior Biologist
Petra Unger .... Senior Botanist
Andy Hatch .... Senior Wildlife Biologist
Mark Bibbo .... Botanist
Ellen Dean .... Botanist
Chad Schneckenburger .... Recreation Specialist
Kelley Savage .... Recreation Specialist
Heather Valentine .... GIS Specialist/Biologist
Lisa Clement .... GIS Specialist
Phi Ngo .... GIS Specialist
Christy Anderson .... Graphics
Amber Giffin .... Senior Publishing Associate
Debby Jew .... Publishing Associate
Gayiety Lane .... Publishing Associate
Jim Merk .... Editor
Julie Nichols .... Editor

Sub-Consultants

Ascent Environmental, Inc.

Curtis Alling, AICP .... Principal/Quality Assurance

kd Anderson

Ken Anderson .... Transportation Engineer

Phillip Williams and Associates

Chris Bowles .... Associate Principal
Mike Liquori.. Senior Associate

Valley & Mountain Consulting

Virginia Mahacek .... Fluvial Geomorphologist

Wildscape Engineering Services

Carol Beahan .... Professional Engineer

7 EIR/EIS/EIS DISTRIBUTION LIST

Elected Officials and Representatives

U.S. House of Representatives

U.S. Government Departments and Agencies

U.S. Army Corps of Engineers
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Environmental Protection Agency – Region 9
U.S. Fish and Wildlife Services
U.S. Forest Service – Lake Tahoe Basin Management Unit
U.S. Geological Survey
U.S. Coast Guard

State of California Government Agencies

Assembly California Legislature
California Department of Fish and Game
California Department of Pesticide Regulation
California State Lands Commission
Department of Boating & Waterways
Department of General Services, Office of Real Estate Services Division
Lahontan Regional Water Quality Control Board
Office of the Attorney General
Caltrans, District 3 – Tahoe
California Tahoe Conservancy
State of Nevada, Department of Environmental Protection
Sierra Nevada Conservancy

Local Government & Agencies

City of South Lake Tahoe
South Tahoe Chamber of Commerce
El Dorado County
- Board of Supervisors, District 5
- Department of Transportation
- Parks and Recreation Department
- Public Works

South Tahoe Public Utility District
Lake Tahoe Unified School District
Lake Valley Fire Protection District
Tahoe Resource Conservation District

Organizations

American Golf
Caltrout
Entrix, Inc.
Fishy Business Consulting
John Harbottle Design
Lake Tahoe Environmental Science Magnet School
Lake Valley Fire Protection District
Lake Tahoe Visitors Authority
League to Save Lake Tahoe
Meyers Round Table
Mountain Democrat
Nevada Fire Safe Council
River Run Consulting
SBC California
Swanson Hydrology and Geomorphology
Sierra Nevada Alliance
Sierra Pacific
Sierra Sun
South Tahoe Public Utility District
Southwest Gas Corporation
Sugarpine Foundation
Tahoe Area Sierra Club
Tahoe Daily Tribune
Tahoe Mountain News
Tahoe World
Tahoe-Douglas Chamber of Commerce
Tahoe Science Consortium
Valley & Mountain Consulting
Tahoe Paradise Resort Improvement District
Washoe Tribe of Nevada and California, Environmental Department

Individuals

Names withheld for privacy.

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Alternative 4: River Stabilization with Existing 18-Hole Regulation Golf Course	ES-5, 1-5, 2-3, 2-8, 2-22, 2-25, 2-81, 2-82, 2-83, 2-85, 2-86, 2-87, 2-88, 2-89, 2-90, 2-91, 2-92, 2-93, 2-95, 3.2-17, 3.2-18, 3.2-20, 3.2-22, 3.2-26, 3.2-27, 3.2-29, 3.2-31, 3.2-32, 3.2-34, 3.2-35, 3.2-36, 3.3-37, 3.3-56, 3.3-57, 3.3-58, 3.3-59, 3.3-61, 3.4-63, 3.4-64, 3.4-65, 3.4-66, 3.4-67, 3.4-68, 3.4-69, 3.5-97, 3.5-98, 3.5-99, 3.5-100, 3.5-101, 3.5-102, 3.5-103, 3.5-104, 3.5-105, 3.6-36, 3.6-37, 3.6-38, 3.6-39, 3.6-40, 3.7-33, 3.7-34, 3.8-29, 3.8-30, 3.8-31, 3.9-19, 3.10-33, 3.10-34, 3.10-35, 3.10-36, 3.10-37, 3.10-38, 3.10-39, 3.10-40, 3.10-41, 3.10-47, 3.11-35, 3.11-36, 3.11-37, 3.12-28, 3.12-29, 3.12-30, 3.13-16, 3.13-17, 3.14-22, 3.14-23, 3.14-24, 3.14-25, 3.15-19, 3.16-17, 3.16-18, 3.16-19, 3.16-20, 3.16-21, 3.16-22, 3.16-23, 3.16-24, 3.16-27, 3.16-28, 3.16-33, 3.16-35, 3.16-36, 3.16-37, 3.16-38, 3.16-39, 3.16-40, 3.16-49, 3.16-53, 4-3, 4-5, 4-7, 4-8, 4-13, 4-16, 5-4
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