California State Parks

Recreational Pursuits and Destinations

Final Report

September 2007

07-22082-1

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Prepared for
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07-22082-1

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1. Introduction

This report presents the results of the data collected by ICF International under the California State Parks Off-Highway Vehicle Fuel Tax Transfer project regarding recreational use of vehicles and recreational destinations. The purpose of this project is to provide data to assist the Department of Transportation and the Off-Highway Motor Vehicle Recreation Division in making estimates of the amount of fuel[1] used for off-highway vehicle (OHV) recreation on public lands in California. The purpose for such estimates is to facilitate decisions regarding transfers of fuel tax funds to the Off-Highway Vehicle Trust Fund. The secondary purpose is to provide estimates of geographic and types of recreational use. The methodology employed entailed two types of surveys:

- Random digit dial telephone surveys of over 15,000 California households during the period July to December 2003 to estimate the percentage of households that own an OHV, the percent of households that engage in off-highway vehicle recreation, and to determine the population of non-registered off-highway vehicles
- Written diaries by over 15,000 California vehicle owners during the period April 2004 to March 2005 to determine the amount of recreational fuel use for off-highway recreation in California on public lands

The survey results and methodology were detailed in a report issued September 2006 (referred herein as the Survey Report).[2] In that report, the two surveys were explained in detail along with results from the surveys. While the Survey Report provides some initial estimates of recreational use and destination, further refinements were done which are detailed in this report.

A further use of this report is to allow allocation of the in-lieu funds. Since the start of the OHV Program, $4.00 of every non-street legal registration [Green/Red Sticker], collected by the Department of Motor Vehicles, has gone to the State Controller "in lieu" of all taxes for the value levied for state or local purposes for the issuance or renewal of identification for every off-highway motor vehicle subject to identification. The Controller pools the income for 6 months

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[1] "Motor vehicle fuel" as defined in the California Revenue and Taxation Code Section 7326 means gasoline and aviation gasoline. It does not include jet fuel, diesel fuel, kerosene, liquefied petroleum gas, natural gas in liquid or gaseous form, alcohol, or racing fuel.

[2] ICF International, Estimating the State Fuel Tax Paid on Gasoline Used in the Off-Highway Operation of Vehicles for Recreation – Survey Results, September 2006. Available at http://www.ohv.parks.ca.gov/pages/1140/files/fuel%20tax%20survey%20report.pdf.

and then sends it out to counties based upon the fuel consumption for that county as determined from the Fuel Tax survey. Prior to 2006, the allocations for counties and cities were based upon census data for county and city populations. Counties and cities with large populations and little or no off-highway motor vehicle recreation received the majority of in-lieu taxes and many counties with relatively small populations, but significant impacts from off-highway motor vehicle recreation, received few in-lieu tax revenues. Effective January 1, 2006, the allocations are determined by the proportional estimated off-highway motor vehicle use and related activity within the respective jurisdictions. Thus, the amount of fuel used for recreation in a given county by registered non-street licensed vehicles determines the fraction of in-lieu funds a county receives. This report provides better resolution of the county fuel use percentages used for this purpose.

2. Methodology

Of the two surveys, the vehicle log book survey provided the best information on recreational use and destination. Since it is tied to actual vehicle and fuel use in pursuit of recreation, this survey was used to determine the recreational areas and recreational purposes of people when they operated their vehicles off-highway in pursuit of recreation.

There were two issues which were not previously addressed in the Survey Report that are dealt with here are:

1. Recreational areas in more than one county
2. Weighting factors representative of vehicle use on a yearly basis

2.1. Assigning Recreational Areas to Counties

In the Survey Report, recreational areas were assigned to only one county. Upon review of this methodology with State, it was found that several recreational areas are actually in more than one county and recreational use in those recreational areas should be divided upon area within the county. As such the following modifications were made:

- Recreation fuel used at Carnegie SVRA was previously allocated entirely to Alameda County. Approximately 60% of the park is located in San Joaquin County, which received no credit for OHV fuel use. Therefore, the portion of the Alameda allotment of attributed to Carnegie was redistributed 60% to San Joaquin County and 40% to Alameda County.
- Riverfront Park is located in Yuba County. The fuel use attributed to Butte County in the previous analysis was redistributed to Yuba County.
- Jackson, Pioneer and western Highway 88 fuel use was attributed to El Dorado County in the previous analysis. These locations are all within Amador County. Therefore fuel used in those recreational areas was redistributed to Amador County.
- Hope Valley/Markleeville and Kirkwood/Eastern Highway 88 fuel use was attributed to El Dorado County in the previous study. These areas are located in Alpine County. The county boundary is Highway 88 and Hope Valley and thus is definitely in Alpine County. Fuel used in those areas was assigned to Alpine County

- Shasta-Trinity National Forest fuel use was attributed to Humboldt County in the previous analysis. This forest is located in both Shasta and Trinity County, not in Humboldt County. Therefore, 50% was redistributed to Shasta County and 50% to Trinity County.

- Ballinger Canyon was attributed to Kern County in the previous analysis. It is located in Ventura County. Therefore fuel used in that area was redistributed to Ventura County.

- Los Padres National Forest was attributed to Kern County in the previous analysis. Los Padres National Forest is located in Ventura County. Therefore fuel used in that area was redistributed to Ventura County.

- El Mirage Dry Lake OHV Area which is located in San Bernardino County was attributed to Los Angeles County in the previous analysis. Fuel used in that area was redistributed to San Bernardino County.

- Approximately 40% of Hungry Valley SVRA is located in Ventura County and 60% in Los Angeles County. Therefore 40% of the fuel used at Hungry Valley SVRA was redistributed to Ventura County and the remaining 60% to Los Angeles County.

2.2. Revised Vehicle Weights

For determination of fuel use by vehicle type by month, a weighting scheme was used that provided a different methodology for vehicles which were chosen from the telephone survey versus those that were randomly picked from the DMV registrations. This is because the telephone survey oversampled some counties for non-street licensed vehicles, oversampled OHV-owning households, and had an inherent bias due to the number of telephone lines in a household (See Survey Report, Sections 4.5 and 5.11.3). The resultant average gallons per month per vehicle per vehicle type determined using these weights were then multiplied by the total number of vehicles of each vehicle type in California. To calculate the amount of annual recreational vehicle use or recreational destinations, a different methodology was necessary. This is because the fuel used for recreational pursuits and destinations on a yearly basis is tied to vehicles and not households. In order to use a consistent weighting scheme for the telephone and DMV registration surveys, new weights needed to be defined for the telephone survey vehicles.

In the previous analysis, for street-licensed vehicles or registered non-street-licensed vehicles in Waves 2 through 6[3], the fuel log books were randomly drawn from the DMV registration database. In this case, to estimate the total gallons of fuel used for recreation by a given vehicle class over a given wave, the estimate is the vehicle-weight weighted sum of the gallons used for all the log books, using the weights shown in section 5.11.4 of the Survey Report. Similarly, the gallons used for recreation at parks in a given county are estimated as the vehicle-weight weighted sum of the gallons used recreating at parks in that county.

For the log-books in Wave 1 and for non-registered non-street-licensed vehicles in Waves 2 through 6, the log-book households were randomly drawn from the telephone survey responders and the original vehicle weights (Section 5.11.3 of the Survey Report) cannot be used in the same manner to properly estimate total gallons used or gallons used for recreating at parks in a given county. However, this section describes how the original vehicle weights were revised so that the vehicle-weighted sums of gallons used estimates the gallons used in California for all vehicle classes and waves.

The original vehicle weight for the vehicles selected from the telephone survey households was given by the equation:

Original Vehicle Weight = Sampling Weight × Vehicles (u, county, A. B)
× Households / Σ Sampling Weight,

where

Sampling weight = N(county, A, B) / {n(county, A, B) × Telephones(u, county, A, B)}.

To obtain the estimated gallons per vehicle for vehicle class T, you take the original-vehicle-weight weighted sum of the gallons used by each diary vehicle in the vehicle class, and then divide it by the sum of the original vehicle weights. To estimate the total gallons used by vehicle class T, you then multiply the estimated gallons per vehicle by the total number of vehicles in that class (Table 5-8 of the Survey Report). This is the same as multiplying the gallons used by each diary vehicle by the revised vehicle weight, defined as the original vehicle

[3] As described in the Survey Report, waves were two month periods in which log books were completed by a given vehicle operator. Wave 1 started with April and May of 2004 and continued at two month waves with Wave 6 being February and March of 2005.

weight divided by the sum of the original weights and then multiplied by the total number of vehicles in that class:

Revised Vehicle Weight = Original Vehicle Weight / Σ Original Vehicle Weight
× Vehicles of Class T in California,

where the sum is over all diary vehicles of class T in the given wave.

For the vehicles selected from the DMV registration database, no change is needed; the revised vehicle weight equals the original vehicle weight.

Using the revised vehicle weights, the total gallons used is estimated by the revised-vehicle-weight weighted sum of the gallons used by each diary vehicle. This calculation can be used for all vehicles, or for one or more specific vehicle classes, for the whole year, or for one or more two-month periods, for all recreational uses, or for use in a given recreational area, county, or type of recreation. In particular, the revised vehicle weights can be used to give exactly the same estimates of annual total gallons used as those in the Survey Report.

A slight modification of the revised vehicle weight equation was used for the non-street-licensed Other registered and non-registered vehicles. Since the registered and non-registered Other non-street-licensed vehicles were combined into a single class for estimating gallons per vehicle (see page 5-22 of the Survey Report), those two classes are also summed together for calculating the revised vehicle weights for the registered and non-registered Other non-street-licensed vehicles. Although this gives correct results for the combined class of registered and non-registered Other non-street-licensed vehicles, the gallons used for the individual classes of registered Other non-street-licensed vehicles and of non-registered Other non-street-licensed vehicles are not correctly estimated using the revised vehicle weights.

2.3. Recreational Pursuit Weighting

The fuel use log books allowed vehicle operators to insert up to three recreational pursuits that they engaged in during the log book day. Since no use fractions for the various pursuits were given for the day of driving, gallons used in a day were divided equally between all pursuits listed. Therefore if a log book listed three pursuits in a given day, the gallons of fuel used in that day would be divided by three and a third of the gallons used would be allocated to

the three pursuits. If two were listed, the amount would be equally divided between the two. If only one was listed, all gallons for that day would be assigned to that pursuit.

There is an issue which should be noted in this methodology. The method of dividing the gallons equally between the various pursuits may mask the real intention of driving off-highway. The effect of this assumption is further discussed in Section 3.2 of this report.

3. Results

This section presents the results of the study. The first subsection describes the recreational use by county for registered off-highway vehicles for use in distributing in-lieu funds collected from the registration fees for registered off-highway vehicles. The second subsection describes the recreational pursuits in terms of gallons of gasoline used off-highway in pursuit of those activities.

3.1. Recreational Destinations

Based upon the log book survey and using the methodology described in Sections 2.1 and 2.2, gallons of fuel used in off-highway recreation by registered off-highway vehicles (green or red sticker) were allocated to the counties in which the recreation occurred. The results are shown in Table 3-1 along with the allocation percentage to use for the in-lieu funds. Note that the total gallons in Table 3-1 are slightly different from those in Table 6-9 of the Survey Report due to rounding errors.

Table 3-1. Recreational County Registered Off-Highway Vehicle Usage

County	Annual Recreation Gallons	% Allotment
Alameda	118,556.68	0.59%
Alpine	36,707.71	0.18%
Amador	50,740.94	0.25%
Butte	79,851.51	0.40%
Calaveras	31,806.85	0.16%
Colusa	424,052.36	2.12%
Contra Costa	--	0.00%
Del Norte	2,058.38	0.01%
El Dorado	657,626.45	3.29%
Fresno	89,263.60	0.45%
Glenn	2,883.52	0.01%
Humboldt	15,221.77	0.08%
Imperial	4,996,625.67	24.97%
Inyo	6,589.35	0.03%
Kern	1,305,514.76	6.52%
Kings	--	0.00%
Lake	30,254.25	0.15%
Lassen	186,209.63	0.93%
Los Angeles	1,324,047.90	6.62%
Madera	--	0.00%
Marin	--	0.00%
Mariposa	--	0.00%

Table 3-1. Recreational County Registered Off-Highway Vehicle Usage (continued)

County	Annual Recreation Gallons	% Allotment
Mendocino	--	0.00%
Merced	--	0.00%
Modoc	5,169.79	0.03%
Mono	171,441.71	0.86%
Monterey	--	0.00%
Napa	144,430.89	0.72%
Nevada	324,684.15	1.62%
Orange	119,876.86	0.60%
Placer	275,539.01	1.38%
Plumas	630,488.63	3.15%
Riverside	955,536.05	4.78%
Sacramento	74,404.12	0.37%
San Benito	1,039,520.92	5.20%
San Bernardino	2,922,365.94	14.61%
San Diego	517,318.69	2.59%
San Francisco	--	0.00%
San Joaquin	177,835.02	0.89%
San Luis Obispo	1,475,488.71	7.37%
San Mateo	--	0.00%
Santa Barbara	5,760.63	0.03%
Santa Clara	179,942.36	0.90%
Santa Cruz	--	0.00%
Shasta	298,437.03	1.49%
Sierra	144.25	0.00%
Siskiyou	134,775.83	0.67%
Solano	21,092.64	0.11%
Sonoma	--	0.00%
Stanislaus	16,838.72	0.08%
Sutter	--	0.00%
Tehama	35,120.18	0.18%
Trinity	89,080.17	0.45%
Tulare	89,668.24	0.45%
Tuolumne	183,874.77	0.92%
Ventura	685,799.44	3.43%
Yolo	5,495.01	0.03%
Yuba	70,562.31	0.35%
Total	20,008,703.38	100.00%

3.2. Recreational Pursuits

Gallons of gasoline used in various off-highway pursuits are shown in Table 3-2. As can be seen from that table, over 50 percent of the gallons used off-highway is used for recreational driving, i.e. driving on off-highway areas for enjoyment. The second highest fuel use was for camping, although it should be noted that roads or trails are generally required to reach a camping spot. Fishing and hunting followed.

To test the assumption of splitting gallons evenly between the three recreational pursuits, all gallons used for recreation during a day was given to the first pursuit only. The results of assigning all the gallons to the first pursuit were that driving for recreation increased from 53.6 percent to 58.5 percent. Camping increased from 13.1 percent to 14.0 percent but fishing dropped from 7.4 percent to 7.0 percent. Therefore the variation caused by such an assumption is relatively small and does not change the general order of how people recreate with their vehicles. Again the total gallons in Table 3-2 are slightly different from those in Table 6-9 of the Survey Report due to rounding errors.

Table 3-2. Recreational Pursuits

Activity	Weighted Gallons			Use Percentage
	SLVs	OHVs	Total	
Recreational Driving	60,201,465	20,744,709	80,946,174	53.6%
Backpacking	613,786	1,398	615,184	0.4%
Bicycling	3,385,817	796,804	4,182,620	2.8%
Non-Motorized Boating	591,210	33,336	624,546	0.4%
Camping	17,551,023	2,179,932	19,730,955	13.1%
Climbing	494,795	543,170	1,037,965	0.7%
Fishing	10,739,741	388,230	11,127,971	7.4%
Gold/Silver/Rock Collecting	1,456,823	27,067	1,483,890	1.0%
Hiking/Walking/Jogging	8,603,174	513,498	9,116,672	6.0%
Horseback Riding	421,998	5,816	427,813	0.3%
Hunting/Target Practice	7,276,250	409,316	7,685,567	5.1%
Motor Boating	242,863	148,982	391,845	0.3%
Animal/Bird Watching	1,748,790	28,505	1,777,294	1.2%
Para/Hang Gliding	5,042	448	5,489	0.0%
Photography/Painting	1,993,830	78,168	2,071,998	1.4%
Picnicking	2,529,118	260,179	2,789,297	1.8%
Sailing/Sailboarding	-	299	299	0.0%
Skiing/Snowboarding	2,752,859	22,989	2,775,848	1.8%
Spelunking	55,750	3,742	59,492	0.0%
Snow Shoeing	191,556	1,909	193,465	0.1%
Swimming	643,167	18,604	661,771	0.4%
Astronomy	234,695	6,232	240,927	0.2%
Other	3,002,349	9,979	3,012,328	2.0%
Total	124,736,098	26,223,311	150,959,409	100.0%