Figures

Photos

Chapter 9. Multi-Use Trails

To be considered “multi-use”, a trail must be designated for cyclists, equestrians, and pedestrians. Trails that allow cyclists and pedestrians or trails that allow equestrians and pedestrians are not considered “multi-use”. (See Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design.*) Multi-use trails are designed to accommodate a variety of user groups on the same trail. The planning, layout, design, and construction discussed in Chapters 5, 6, and 7 apply to multi-use trails. However, there are additional criteria outlined in this chapter.

Photo 9.1 - Multi-Use Trail Users

9.1. Multi-Use Trail Limitations

Multi-use trails accommodate three different use types. Each has its own design needs and user expectations. (See Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design.*) When all of these groups share the same trail, not all of the design needs and expectations can be met. Multi-use trail design and construction represent a compromise between the different groups. This compromise can often result in less user satisfaction and greater difficulty in the design and construction of a sustainable trail.

The most significant safety concerns are between cyclists and equestrians. These safety concerns center on the reaction of horses to the movement of cyclists. The physical and behavioral characteristics of horses make them susceptible to flight when cyclists approach unexpectedly. (See Chapter 7, *Equestrian Trail Design.*) The size, shape, sound, and speed of the bike and rider can startle a horse, which can lead to the

horse rearing up, kicking, or bolting. Safety concerns can be partially mitigated by posting speed limits and designing trails that slow the cyclist, giving the horse more time to recognize the rider and react appropriately. See Chapter 6, *Mountain Bike Trail Design*, for information on the use of pinch points and tread texturing to control user speeds.

Another design technique is to make the multi-use trail wider and straighter, with longer sight distances and broader turning radii than are typically employed. These characteristics allow users to see and hear each other sooner, giving them more time to stop and get off the trail and providing more passing room. Unfortunately, these characteristics also conflict with the design needs and expectations of users. The resulting trails have more structures, less sinuosity, and less intimacy with the surrounding environment. In addition, making trails wider and straighter with greater sight distances and broader turning radii can encourage cyclists to ride faster, which diminishes the effectiveness of design elements intended to slow users.

Multi-use trails are appropriate when the landbase is insufficient to support trails specifically designated for hiking, equestrian, or bicycle use, or when the trail is used as a main artery of a larger trail system. As discussed in Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design*, pedestrian, cyclist, and equestrian trails can connect to other similar loops or loop back to the multi-use artery. (Figure 9.1.)

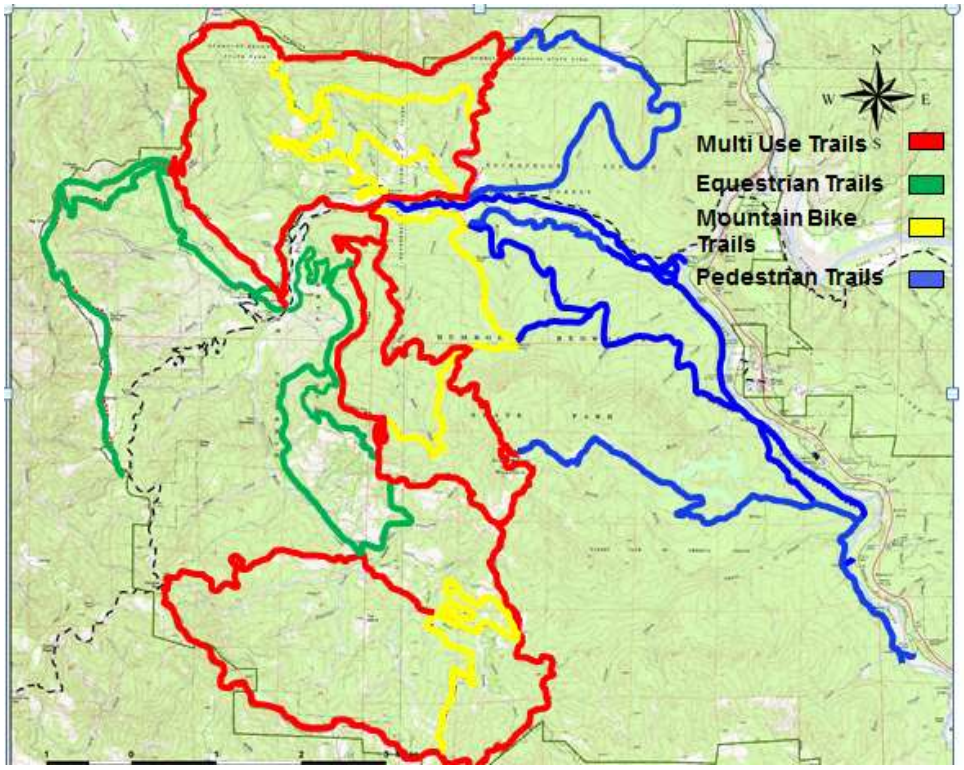

Figure 9.1 - Shared and Separate Trails with Loops

When planning a multi-use trail or improvements to an existing network, it is essential to involve the potential user groups. Their input and problem resolution strategies can ease future complaints and trail use issues. Some approaches to problem resolution include “trail etiquette” signage, park-sponsored multi-use trail rides, user group self-enforcement, and trail problem resolution workshops.

Many trail systems use backcountry roads as adjunct trails to connect trails and expand user circulation. Properly designed and constructed backcountry roads with increased width, sight distance, and turning radii can be very effective multi-use routes.

9.2. User Protocols

When different user groups share the same trail, cyclists and hikers on a multi-use trail must yield the right of way to equestrians and cyclists yield to pedestrians. All multi-use trails should have signage that identifies the right of way protocol as described in Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design*.

9.3. Design Requirements

Design for multi-use trails should be based on the highest standards for the intended user groups. Equestrian trails have the highest design and construction standards, so those are the minimum standards for any multi-use trail. (See Chapter 7, *Equestrian Trail Design*.)

9.3.1. Trail Length and Circulation

Since multi-use trails accommodate horses and bikes, the recommended trail length, connecting loops, and circulation patterns identified in Chapters 6 and 7 should be applied whether the entire trail system is designed for multi-use or as a connecting artery. (See Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design.)*

9.3.2. Tread Width

Multi-use trails have a minimum tread width that is consistent with the Class 1 equestrian standard of 36 inches. Where the hillslopes are steep and hikers and cyclists may have difficulty stepping off the trail, passing areas a minimum of 60 inches wide and 60 inches long should be provided. The frequency of passing areas along the trail is determined by site conditions, including sight distance, percent of hillslope, stability of the parent soil, and characteristics of the terrain.

9.3.3. Trail Layout and Tread Construction

The general layout and design for multi-use trails follow those identified in Chapter 5, *Principles Trail Layout and Design*. In addition, layout of multi-use trails should avoid low gradient hillslopes (less than 20%) and flat ground. If flat ground cannot be avoided, elevate the trail tread by constructing a turnpike or causeway. (See

Chapter 16, *Drainage Structures.*) On hillslopes, multi-use trails should have a full bench for greater durability and sustainability. Since horses and cyclists have a tendency to use the outside portion of the tread, full bench construction is a must. Construction practices should follow those outlined in Chapter 11, *Principles of Trail Construction*.

If parent or native soils are not suitable for long-term sustainability, strengthen the trail tread by adding crushed rock aggregate. (See Chapter 11, *Trail Construction.*) Mixing native soil into the top layer of aggregate helps bind the aggregate, softens its appearance, and reduces the impact to horses' hooves. Hard and smooth trail surfaces, such as concrete, soil cement, asphalt, and non-permeable soil stabilizers, should not be used for multi-use trails. These surfaces are slippery and can cause horses to lose traction and fall. They also can injure the bottom of the horse's hoof (frog).

9.3.4. Grade Uniformity

When laying out and constructing multi-use trails, it is important to avoid sudden changes in linear grade to avoid the additional mechanical wear caused by trail users when they encounter a sudden grade pitch. The need for a sustainable grade is discussed in Chapter 5, *Principles of Trail Layout and Design*, Chapter 6, *Mountain Bike Trail Design,* and Chapter 7, *Equestrian Trail Design*.

9.3.5. Sinuosity

Unless a multi-use route is placed on a well designed and constructed backcountry road, the trail alignment will need sufficient sinuosity to slow down cyclists. Alignment techniques include curving the trail around native trees, brush, and rocks, or installing pinch points. Multi-use trails should be designed wide enough to accommodate hikers, horses, and bicycles. This increased tread width may allow for increased bike speed and associated safety concerns. Thus, slowing cyclists is critical to designing a safe and sustainable multi-use trail. These design techniques are discussed in Chapter 5, *Principles of Trail Layout and Design,* and Chapter 6, *Mountain Bike Trail Design*.

9.3.6. Low Trail Structures

Low trail structures, such as steps and water bars, cause problems for horses and cyclists, and should not be used in multi-use trails. Elimination of these structures will also reduce the barriers to users with mobility challenges. In most cases, water bars are not an effective drainage solution and should be avoided. (See Chapter 5, *Principles of Trail Layout and Design.*)

9.3.7. Switchbacks and Climbing Turns

Switchbacks and climbing turns should be designed and constructed as discussed in Chapter 12, *Topographical Turn, Switchback, and Climbing Turn Construction*.

When designing switchbacks and climbing turns, the design and construction standards should be for equestrian trails, which are the highest standards of the three user groups. (See Chapter 7, *Equestrian Trail Design.*)

9.3.8. Watercourse Crossings

For the layout and design of multi-use trails, dry crossings are preferable to wet crossings. Culverts, puncheons, and bridges on multi-use trails should be designed to equestrian trail standards. All approaches to watercourse crossing structures are constructed at trail grade. (See Chapter 6, *Mountain Bike Trail Design,* Chapter 7, *Equestrian Trail Design,* and Chapter 14*, Drainage Structures.*)

The process for selecting crossing sites is discussed in Chapter 5, *Principles of Trail Layout and Design.* All wet crossings, even those across ephemeral swales, need to be armored to protect soil and stream gravel, reduce erosion and sediment delivery, and provide a sustainable crossing. (See Chapter 16, *Drainage Structures*.)