

Uses in Class III areas include swimming, picnicking, hiking, fishing, wildlife viewing, and boat-in camping.

The Napa County General Plan designates the study area as Agriculture, Watershed, and Open Space (Napa County 2008). Policy ROS-15 in the Recreation and Open Space Element of the General Plan identifies an objective of completing the Lake Berryessa Trail, which is the regional trail system around the lake. The Agricultural Lands Preservation Initiative, also known as Measure J (extended by Measure P), prevents the re-designation of non-federal parcels classified as Agriculture, Watershed, and Open Space to another use or the subdivision of these parcels to less than 160 acres through the year 2058, unless a designation is approved by voters. General Plan amendments involving open space cannot be implemented without a majority vote.

Environmental Consequences

No Action Alternative

The land use conditions under the no-action alternative would be the same as current conditions. Some land use conflicts could occur periodically due to recreation uses conflicting with agricultural uses. A decrease in trail use due to continuing deterioration of the trail would be expected, making agricultural conflicts less likely. Such conflicts may include occasional conflicts between trail user traffic and agricultural traffic or disruptions to grazing activities on nearby land from trespassing or other activities.

Proposed Action

Under the proposed action, the land use setting of the study area would not change. The existing North End Trail would be improved and rehabilitated, and the current recreation/open space use of the area would remain. The proposed action would not conflict with the RAMP or Napa County General Plan and would not require amendments to either of these plans. Implementation of the proposed action would fulfill the VSP ROD goal of providing a regional trail system at Lake Berryessa (the North End Trail would be a segment of the regional system). Indirect effects resulting from the new North End Trail may include increased traffic along Berryessa-Knoxville Road from increased use, increased air pollutants from increased traffic, increased traffic noise from increased traffic, and increased conflicts with nearby agricultural operations. Traffic, air quality, and noise are discussed in other sections of this chapter.

Traffic-related conflicts with agricultural operations in the area could arise from increased trail use, such as agricultural vehicles using Berryessa-Knoxville Road; use-related conflicts with agricultural operations could also arise, such as from trail users illegally trespassing on adjacent private lands or disturbing grazing activities. Such conflicts would likely be infrequent and would be addressed through fencing, signs, and pull-outs along the road, as well as local law enforcement, should the need arise.

Noise

Affected Environment

Lake Berryessa is in a remote rural setting with relatively low existing noise levels, with the exception of higher-use recreational areas along the western shore. Under previous operations, the most intense noise occurred at the resorts on the western shore during summer daylight hours (9:00 a.m. to 4:00 p.m.) due to the concentrated operation of motorized watercraft (i.e., motorboats and personalized watercraft) in and around the marina (U.S. Bureau of Reclamation 2005) during the peak recreation season, May through September.

The primary sources of noise in the vicinity of the study area are vehicles, recreation activity, and motorized watercraft. No noise sensitive or major noise areas occur in the Lake Berryessa vicinity according to the Noise Element of the Napa County General Plan (Napa County 2008). Trail users may be considered sensitive receptors, however, because visitor experience is generally enhanced by a quiet environment.

Napa County monitored noise levels in select locations throughout the county during 2004, including two locations near Lake Berryessa, on Berryessa-Knoxville Road at the Welcome to Lake Berryessa sign and at Chaparral Cove Concession Area formally known as Steele Park Resort (Boat Launch Ramp) (Table 2).

Table 2. Summary of Short-Term Noise Monitoring Results

Location	Date	Duration (minutes)	L _{eq}	L _{max}	L _{min}	L _{peak}	L ₁₀	L ₃₃	L ₅₀	L ₉₀
Berryessa-Knoxville Road at "Welcome to Lake Berryessa" sign	12/3/04	20	37.8 ¹ 32.9 ²	60.9	29.2	92.8	35.8	31.1	30.4	29.5
Resort formally known as Steele Park Resort (Boat Launch Ramp)	12/10/04	20	45.9	62.1	32.5	87.3	47.7	40.7	38.8	36.0

Source: Napa County 2005

Notes: ¹ Denotes measured L_{eq} from entire noise monitoring episode

² Denotes calculated L_{eq} with single event noise sources (i.e., automobile drive by) removed

Noise levels are reported in A-weighted decibels (dBA)

Abbreviations: L_{eq}=equivalent sound level; L_{max}=maximum sound level; L_{min}=minimum sound level; L_x=percentile-exceeded sound level

The maximum noise level during the monitoring period was 60.9 dBA (A-weighted decibel) at Berryessa-Knoxville Road and 62.1 dBA at the resort formally known as Steele Park Resort (Napa County 2005). These noise levels

are typical of a commercial area or vehicle traffic corridor. Most of the noise measurements were less than 35.8 dBA at Berryessa-Knoxville Road and less than 47.7 dBA at the resort formally known as Steele Park Resort. These low noise levels are comparable to a quiet residential neighborhood at night. Traffic was the dominant source of noise.

Environmental Consequences

No Action Alternative

No construction activities would occur under the no-action alternative; thus, no construction-related noise would be generated. Noise from trail users and associated traffic would likely be less than under current conditions (comparable to a quiet urban or suburban nighttime) due to reduced use of the deteriorating trail.

Proposed Action

Under the proposed action, construction activities associated with the trail rehabilitation would generate temporary noise from equipment use, construction traffic, and human presence. Because of the currently quiet setting, construction noise would be noticeable to recreationists close to the trail and may be noticeable to other recreationists on the lake. The topography and vegetation surrounding most of the study area would serve as a natural noise buffer for uses further away from the study area. Closure of segments of the existing trail during construction would reduce the potential for recreationists to be in the area during construction and be exposed to substantial noise levels. No other sensitive receptors (i.e., residential uses) would be affected by temporary noise from construction.

Noise associated with trail use and traffic from trail users would be similar to current conditions, with occasional periods of increased noise during the summer when trail use is expected to be higher. The noise would blend in with other noise from recreationists at the lake and normal traffic on Berryessa-Knoxville Road.

Public Health and Safety

Affected Environment

The existing North End Trail poses a health and safety concern for users because of its proximity to the shore of Lake Berryessa, ongoing erosion, and the poor condition of the fencing and gates at the trail access points. Segments of the trail are in close proximity to, and in some cases on the edge of, eroding cliffs or landslides. Because of its deteriorating condition, the trail requires frequent maintenance to keep it in acceptable condition for visitors.

Basic responsibility for the health and safety of visitors is shared among the State of California, Napa County, and Reclamation. Fire protection and

suppression activities around Lake Berryessa are provided primarily by the California Department of Forestry and Fire Protection, with local support from volunteer and county fire departments. The study area is in a medium to high fire-hazard area (Napa County 2008). Due to the size of the Lake Berryessa area and isolated conditions, response times can vary. Generally, water stanchions are available at recreation sites in the vicinity, and fire protection and suppression plans have been established. Reclamation has prepared and periodically updates a Fire Management Plan that provides policies and management actions for wildfire and fuels management in the Lake Berryessa Federal Recreation Area.

Environmental Consequences

No Action Alternative

Public health and safety would continue to be at risk under the no-action alternative due to a lack of trail improvements. The existing deteriorating trail conditions would continue to expose trail users to unsafe cliffs and potential landslides along the shore of Lake Berryessa, as well as dense, overgrown vegetation. Such conditions increase the risk of accidents and the need for emergency response services. Trail access would also continue to be difficult due to the poor condition of the gates leading to the trail and parking conditions along the road. Fire hazards would also create a risk for trail users, as well as surrounding uses, due to a lack of regular trail maintenance (e.g., vegetation removal).

Proposed Action

Under the proposed action, the trail rehabilitation would improve public safety and benefit trail users. Deteriorating segments of the trail would be rehabilitated or relocated to reduce or eliminate unsafe trail conditions. Trail access would also be improved with designated and improved trailheads and upgraded gates. Parking would be improved with connectivity between the trailheads and pullouts along the road.

The new trail would require minimal maintenance, and overgrown vegetation would be removed or controlled on a more regular basis than under current conditions. Fire hazards, however, would be similar to current conditions in the vicinity. The trail's improved conditions would not contribute to an increased potential for wildfires, but construction vehicles and use of gas-powered tools (e.g., chainsaws) during trail construction could create a temporary fire risk. The trail would serve as a fire break between the lake and the upland areas. Signage would be placed appropriately to warn hikers of fire danger.

Recreation

Affected Environment

Lake Berryessa is a popular recreation area, receiving more than one million visitors each year. It is the largest reservoir in the eastern foothills of the northern Coast Ranges, and, with the exception of the Sacramento-San Joaquin Delta, it is the only large freshwater resource available to San Francisco Bay Area residents. The lake attracts visitors for a variety of recreation opportunities, such as boating, water skiing, picnicking, camping, hiking, swimming, and fishing. Most of the recreation activities are water-dependent; therefore, visitor use is higher in the summer. An estimated 75 percent of total visitation occurs between Memorial Day and Labor Day weekends (U.S. Bureau of Reclamation 2005).

Formerly, the majority of recreation facilities were located at seven concession areas (resorts), which have been closed. New concession contracts for all seven concession areas have been awarded. New development will begin at each concession area and will include new recreation and public use facilities, such as boat launches, boat storage, marinas, camp sites, cabins, restaurants, cafes, and additional trails.

Government-owned facilities not associated with the concession areas include three free public day-use areas (Oak Shores, Smittle Creek, Eticuera Creek), a free public boat launch (Capell Cove), and three official trails (Smittle Creek, North End, and Pope Canyon trails). Another trail at Markley Cove is an informal social trail system that connects roadside parking areas with the shoreline.

The study area encompasses the North End Trail, a 7-mile long trail that starts at the north end of the Putah Creek Bridge and follows the shoreline to Eticuera Creek. The trail is eroded in some areas and is in need of maintenance or repairs. Current trail users include hikers, wildlife watchers, kayakers, and other visitors enjoying active or passive recreation activities. As a result of the concession area closures, recreation use has decreased at the lake, and a change in recreation activities is occurring, with an increase in hikers, bird watchers, and kayakers.

Environmental Consequences

No Action Alternative

Recreation opportunities at Lake Berryessa would be expected to continue to follow current trends. Under the no-action alternative, recreation opportunities would not be improved on the northwest shore of Lake Berryessa. The condition of the trail would continue to deteriorate, possibly discouraging recreationists and resulting in a decrease in use along the western shore of the lake. Kayakers would continue to have access to the lake from the existing trail. The trail would serve as a segment of the larger regional trail system, consistent

with the VSP ROD, but it would not improve recreation access or opportunities around the lake and would not be a reliable section of the regional trail.

Proposed Action

Under the proposed action, the trail construction would improve recreation opportunities at Lake Berryessa and encourage different types of users to visit the northwest shore. The trail would accommodate hikers, bikers, and kayakers. It would connect to the regional trail system and improve access to areas around the lake. Although visitation is currently down from past years, the rehabilitation of the North End Trail could increase visitation by attracting new visitors to the area and encouraging previous visitors to return to the area. A temporary disruption in recreation use of the trail would occur during construction, but, overall, the trail would result in a long-term benefit to recreation in the Lake Berryessa recreation area. The rehabilitated trail would allow Reclamation to fulfill its objectives under the VSP EIS and ROD by establishing a high-quality trail that would connect into the regional trail system.

Socioeconomics

Affected Environment

Lake Berryessa is a popular destination for residents of Napa County, the San Francisco Bay Area, and the Sacramento metropolitan area. Projected growth in these areas is expected to result in increased use of the Lake Berryessa area, as well as other recreation areas in the region. The study area is not in a populated area; however, the nearby cities of Napa, Vacaville, Fairfield, and Winters, as well as smaller towns along the highways, provide amenities to visitors at Lake Berryessa. An overview of current and projected growth in these areas is provided in this section.

Napa County

According to the U.S. Census Bureau, the 2008 population in Napa County totaled 133,433. Eighty-eight percent of the population was White, 2.3 percent was Black or African American, 7.0 percent was Asian, 1.9 percent was American Indian and Alaska Native, and 0.6 percent was Native Hawaiian or Pacific Islander (U.S. Census Bureau 2008). The City of Napa is the largest incorporated and urban area in Napa County. Its population in 2006 was estimated at 76,705, approximately 57 percent of the county's total population (Napa County 2008). The population of Napa County is projected to grow by less than 1 percent [per year?] through the year 2030, resulting in a total population of more than 130,000.

Vacaville and Fairfield are incorporated cities in Solano County. Vacaville has an estimated population of 96,905, and Fairfield is slightly larger with an estimated population of 106,753. Vacaville is projected to grow by 37 percent, an increase of 35,400 residents, by the year 2035 (City of Vacaville 2009).

Fairfield is projected to grow by about 8.6 percent by the year 2013, resulting in a population of 115,946 (City of Fairfield 2008).

San Francisco Bay Area

The San Francisco Bay Area is defined as the nine-county area represented by the Association of Bay Area Governments, including Sonoma, Marin, Napa, Solano, Contra Costa, Santa Clara, Alameda, San Mateo, and San Francisco counties. According to the U.S. Census Bureau, the 2000 population of the Bay Area was 7 million, consisting of 58.7 percent White (19.7 percent of which was Hispanic or Latino), 7.3 percent Black or African American, 18.4 percent Asian, 0.7 percent American Indian and Alaska Native, 0.5 percent Hawaiian and Other Pacific Islander, and 9.5 percent of some other race (U.S. Census Bureau 2000). The remaining 4.9 percent was two or more races. The Bay Area's population is projected to grow by about 2 million people between 2005 and 2035 (Association of Bay Area Governments 2007).

Sacramento Metropolitan Region

The Sacramento Metropolitan Region is defined as the six-county area represented by the Sacramento Area Council of Governments, which includes El Dorado, Placer, Sacramento, Sutter, Yuba, and Yolo counties. According to the U.S. Census, the 2000 population of this region was 1.7 million (U.S. Census Bureau 2000). Seventy percent of the population was White (of which 15.5 percent was Hispanic or Latino), 7.1 percent was Black or African American, 9.0 percent was Asian, 1.1 percent was American Indian and Alaska Native, 0.5 percent was Hawaiian and Other Pacific Islander, and 7.2 percent was some other race. The remaining 5.2 percent was two or more races. The region's population is projected to increase to 3.23 million people by 2030 and 3.95 million by 2050 (Center for Continuing Study of the California Economy and DB Consulting 2005).

Environmental Consequences

No Action Alternative

Under the no-action alternative, socioeconomic impacts could result from decreased use of the trail and the Lake Berryessa area. Based on the current reduction in recreational visitors at Lake Berryessa from previous years, leaving the trail in its deteriorating condition could further contribute to the reduction in visitation. Without trail improvements, the trail would be less likely to attract visitors to the area, and some level of local socioeconomic impacts from reduced visitation may occur. Reductions in visitors to the lake—whatever the cause—would affect nearby communities because fewer recreationists would pass through the communities, contributing less to the local economy.

Proposed Action

With increased growth in the San Francisco and Sacramento regions, recreation use is expected to increase. Rehabilitation of the trail under the proposed action would provide improved recreation opportunities for the growing populations.

The trail design would accommodate a larger diversity of users and expand recreational opportunities at the lake. The trail would not encourage growth, however, because the populations in the nearby regions are expected to increase regardless of the trail improvements.

An increase in visitation to Lake Berryessa in response to the rehabilitated trail would also contribute to the local economy. Visitors would likely stop in local towns to purchase supplies, food, gas, and other items. Some visitors may also stay overnight in local hotels or camp nearby.

Soils

Affected Environment

Soil Types

The study area occurs on three mapped soil units:

- 114 – Bressa-Dibble complex, 30 to 50 percent slopes (northern and central portions of trail along shoreline)
- 154 – Henneke gravelly loam, 30 to 75 percent slopes (southern extent of trail)
- 167 – Montara clay loam, 30 to 50 percent slopes (southern portion of trail along shore and portion of trail near road)

The Bressa-Dibble complex and Montara clay loam soil units consist of steep, well-drained soils on uplands. The Henneke gravelly loam soil unit consists of excessively drained soils on uplands. Bressa-Dibble soils formed in material weathered from sandstone and shale. Montara and Henneke soils formed in material weathered from serpentine. The plant cover on these soils is typically annual grasses and scattered oaks. Runoff is rapid to very rapid, and the hazard of erosion varies from moderate to severe (Lambert et al. 1978). The Bressa-Dibble complex soil has the most severe erosion potential.

Erosion

Erosion is a natural process that loosens and removes sediment from hillslopes or channel beds and banks. This process is controlled by three primary factors: (1) topography (e.g., steeper slopes result in faster runoff conditions and an increase in transport capacity); (2) soil cover (e.g., vegetation, rocks, pavement, roofs); and (3) flow regime (e.g., rainfall, runoff, irrigation). Modifications to slope, soil cover, or the flow regime can have a direct bearing on the nature and degree of hillslope erosion.

The shoreline of Lake Berryessa is susceptible to erosion through natural wind and wave action and waves created by boaters. One specific area affected by wave action is the cliff at Putah Creek Point (Tate 2009). Portions of the cliff are more than 30 feet high from the water's edge to the top of the vertical face.

The existing trail follows the top of the cliff and currently poses a safety concern to trail users (Tate 2009).

Landslides

Landslides occur throughout the area. Some areas have the potential for moderate to high intensity landslides (Napa County 2005). Most mapped landslides in the area are combined slump-earthflows, while very rapid failures, such as debris flows, mud flows, rock falls, and toppling, are less common. Mapped slides typically range in length from less than 100 feet to several hundred feet. The steep slopes in and near the study area create a moderate potential for landslides.

Evidence of one landslide is in the southern portion of the study area, approximately 0.6 mile north of Putah Creek Point (southern end of proposed trail) (Tate 2009). The landslide is likely inactive as indicated by the presence of vegetation and weathering on the scarp (ridge of the landslide) and undisturbed, mature trees in the main body of the landslide (Tate 2009).

Environmental Consequences

No Action Alternative

Under the no-action alternative, no construction activities would occur; thus, no construction-related impacts on soils would occur. Segments of the existing trail would continue to erode and deteriorate due to unstable soils along the shore of the lake. The soils would not be stabilized or protected, and the trail would continue to pose a safety hazard for users.

Proposed Action

Under the proposed action, segments of the trail along the shore and in eroded areas would be relocated to more stable areas, and retaining walls would be installed to protect steep slopes. The trail would be set back from Putah Creek Point to reduce safety concerns for trail users along the steep cliff. The trail would cross a landslide feature in the southern portion, but the landslide shows evidence of being inactive and would not pose a major safety concern. The trail design would alleviate safety concerns for users related to unstable soils and steep slopes.

Soil disturbance to a depth of up to 4 feet would occur during rehabilitation and restoration of old trail segments, depending on the slope and required grade of the trail. Use of a SWECO trail dozer would minimize the duration and extent of ground disturbance, resulting in minimal soil loss and dust generation during construction. After construction, seeding or planting of native vegetation would stabilize the soils and reduce the potential for future erosion. The trail would be relocated away from the shore areas that are susceptible to erosion, such as at Putah Creek Point.

The trail would become stabilized over time, reducing soil erosion along the trail. The trail design would allow runoff across the trail. The trail would be graded to suitable slopes to accommodate hikers and bikers and would not create hazards from landslides or erosion along the trail. Use of structures that span or protect the drainages that cross the trail alignment would protect the soils in the drainages and reduce soil disturbance from trail users.

Transportation and Circulation

Affected Environment

Regional access to Lake Berryessa is provided by State Route (SR) 121 and SR 128, which feed onto local county roads (Berryessa-Knoxville Road, Pope Canyon Road, Steele Canyon Road, and Wragg Canyon Road). The local roads are paved, two-lane roads that are designed for speeds of 25 to 55 miles per hour. Primary access roads in the area operate below capacity except on weekends and holidays, and accident rates are comparable to those of other state roads on similar terrain.

The Berryessa-Knoxville Road provides the only access to the study area, which is north of Pope Canyon Road. This road is a two-lane, north-south county road that provides access to the west and north shores of the lake. It also provides access to four of the concession areas (Spanish Flat Resort, Berryessa Marina Resort, Rancho Monticello Resort, and Putah Creek Resort), as well as the two public day-use areas, public launch ramp, several small stores, and three private residential developments. Pope Canyon Road intersects Berryessa-Knoxville Road at the northwest corner of the lake south of the study area and serves Lake County and other northern areas.

Traffic on Berryessa-Knoxville Road includes commercial, residential, and recreation users, and daily traffic counts vary depending on the time of year and road segment. During early May 2004, traffic counts estimated an average daily traffic range of 652 to more than 3,000 vehicles (Table 3) (Napa County Department of Public Works 2004). Current traffic is likely lower due to the closure of some of the concession areas and recent reductions in visitation to the lake. Based on the average daily traffic, Berryessa-Knoxville Road operates at levels of service of A and B (Napa County 2008). Level of service A means that traffic is relatively free flowing, with little or no limitation on vehicle movement or speed. Level of service B means that traffic flow is steady, with only slight delays in vehicle movement and speed. A level of service of D or better is the desired condition for county roads.

Table 3. Average Daily Traffic Counts on Berryessa-Knoxville Road – March/April 2004

Road Segment	Time Period	Average Daily Traffic
North of SR 128	4/29/04 – 5/5/04	3,004
South of Mulford Drive	4/27/04 – 5/3/04	652
North of Mulford Drive	4/29/04 – 5/5/04	2299
South of Sugarloaf Drive	4/24/04 – 4/25/04	1156
North of Sugarloaf Drive	4/29/04 – 5/5/04	2446
South of Spanish Flat Loop Road	4/29/04 – 5/5/04	2291
North of Spanish Flat Loop Road	4/29/04 – 5/5/04	2235
South of Putah Creek Drive	4/29/04 – 5/5/04	850
North of Putah Creek Drive	4/29/04 – 5/5/04	1175
South of Pope Canyon Road	4/27/04 – 5/3/04	1147
North of Pope Canyon Road	4/29/04 – 5/5/04	841

Source: Napa County Department of Public Works 2004

Environmental Consequences

No Action Alternative

No construction activities would occur under the no-action alternative; thus, no construction-related traffic would occur. Traffic from trail users would likely decrease in response to a reduction in visitation. Traffic levels may be slightly improved over current conditions.

Proposed Action

Under the proposed action, construction vehicles and equipment would result in a temporary increase in traffic on local roads; also, an anticipated increase in trail users would result in a long-term increase in traffic. Construction traffic would involve construction workers commuting daily to the trail from nearby communities and transportation of construction equipment and materials, which would occur less often. Construction workers would likely park in the designated pullouts and trailhead parking areas along Berryessa-Knoxville Road. Construction traffic would result in an increase in traffic along

Berryessa-Knoxville Road and along other local roads and highways that provide access to the study area. This temporary increase would not result in substantial traffic or reduce the levels of service of the local roads based on their current and projected conditions.

Trail-user traffic would likely increase, as well, and add to the normal traffic on local roads. Higher use would be expected during the summer and on weekends, and minor delays along local roads, especially Berryessa-Knoxville Road, may be experienced as visitors drive to the trail parking areas. The traffic would contribute to current higher levels of traffic that cause reduced level of service during peak periods, but the overall levels of service of local roads would not likely worsen to unacceptable conditions because of the trail-user traffic.

Visual Resources

Affected Environment

Lake Berryessa is a significant scenic and visual resource for visitors, travelers, and residents in the region. The lake is one of the largest freshwater lakes in California and affords visitors with a variety of high-quality scenic vistas and panoramas of the lake and surrounding mountains. The majority of publicly accessible views are from watercraft, local roadways, recreation areas, and the developed areas at the concession areas. The length and configuration of the Lake Berryessa shoreline and the surrounding topography and habitat provide substantial variety in both viewpoint orientation and available views to create a variety of viewing conditions and opportunities around the lake.

Views from the North End Trail across the lake are of the northern portion of the lake and the surrounding mountains to the north and east. Views to the west away from the lake are of the hills and surrounding grasslands and woodlands. Ranch houses and associated outbuildings are visible in the hills in some areas. The Berryessa-Knoxville Road and fences are not visible from most viewpoints along the trail due to the intervening topography and vegetation. Similarly, the trail itself is not visible from most viewpoints around the lake because it tends to blend in with the grasslands. Portions of the trail are visible from the Berryessa-Knoxville Road. Eroded portions of the cliffs adjacent to the lake and shoreline detract from the scenic quality of the area.

Environmental Consequences

No Action Alternative

Under the no-action alternative, the deteriorating condition of the existing trail would detract from the scenic quality of Lake Berryessa. Trail users would still be able to experience scenic views from the trail, but the eroded slopes along segments of the trail would detract from scenic views toward the trail and surrounding northwest shore. No activities would be implemented to improve

the trail conditions, and the trail would continue to deteriorate or become overgrown with vegetation, which would reduce its visibility.

Proposed Action

Trail rehabilitation under the proposed action would improve views of the northwest shore of the lake and increase access for visitors to scenic views from the trail. Eroded areas along the shore would be protected from further erosion by the relocation of the trail and restoration of the old trail segments. The new trail would not be visible from most viewpoints around the lake, and, thus, would not detract from the scenic views toward the northwest shore. The improved trail conditions would attract more visitors to the area and provide more opportunities for the public to experience the scenic views of Lake Berryessa. Minor visual impacts would occur during construction as the new trail alignment is graded, but these impacts would be temporary and the overall effects of the rehabilitated trail would be beneficial.

Water Resources

Affected Environment

Surface Water Features

The study area is adjacent to the northwest shore of Lake Berryessa. Lake Berryessa is 23 miles long and 3 miles wide and has 165 miles of shoreline. It collects flows from a 568-square-mile drainage basin above Monticello Dam. The lake's storage capacity of 1.6 million af fills the reservoir to a water-surface elevation of 440 feet above sea level. Lake levels can fluctuate substantially, depending on hydrological and meteorological conditions, water demands, flood control, and hydropower needs. With the maximum water-surface elevation controlled by the bell-shaped spillway ("glory hole") near the dam, lake levels may fluctuate from a maximum elevation of 455 feet to a minimum elevation of 253 feet.

Several narrow drainages flow into Lake Berryessa through the study area. Sixteen ephemeral drainages and two intermittent streams cross the existing North End Trail (see Figure 5) (North State Resources 2008). Box culverts under Berryessa-Knoxville Road and the trail allow the intermittent streams to flow into the lake. The trail crosses the ephemeral drainages without any type of bridge or culvert. Flow in the drainages originates in the surrounding hills and is primarily from precipitation. These drainages are considered waters of the United States and are subject to the U.S. Army Corps of Engineers' (USACE) jurisdiction under the Clean Water Act.

Water Quality

The Central Valley Regional Water Quality Control Board (RWQCB) designated several beneficial uses for Lake Berryessa in the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Central

Valley Regional Water Quality Control Board 2007). The designated beneficial uses of the lake include municipal and domestic supply, agricultural supply, hydropower generation (potential use), water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, warmwater fish spawning, and wildlife habitat. For each beneficial use, the RWQCB identified appropriate water quality objectives to protect the lake. Water quality conditions in Lake Berryessa are generally consistent with the water quality objectives identified in the basin plan to protect beneficial uses.

Mercury and fecal coliform bacteria are water quality problems that have been identified by the resource agencies. EPA listed Lake Berryessa as a water quality limited segment for mercury contamination pursuant to Section 303(d) of the Clean Water Act. Mercury contamination in fish has been a problem at the lake, and signs have been posted cautioning fishermen to limit fish intake. In addition to mercury, wastewater discharges from the concession areas has increased fecal coliform bacteria in the water and created a water quality concern. Closure of the concession areas could reduce bacteria problems in the lake.

Environmental Consequences

No Action Alternative

No construction activities would occur under the no-action alternative; thus, construction-related impacts on drainages or water quality of the lake would not occur. Soils along the existing trail would continue to erode and be disturbed by trail users, resulting in discharge of sediment into the drainages and lake. As the shoreline continues to erode, larger quantities of sediment would be discharged into the lake and could affect the water quality of the lake. The trail would not, however, contribute to existing water quality concerns related to mercury or fecal coliform bacteria. Trail users would continue to disturb the ephemeral drainages as the users cross through the drainages.

Proposed Action

Under the proposed action, construction activities could result in discharges into the ephemeral drainages and intermittent streams that could temporarily affect the water quality of the drainages and lake. Bridges would span the intermittent streams and some ephemeral drainages, and wet crossings would be placed in the remaining ephemeral drainages to allow pedestrian and bicycle access across the drainages during periods of flow and to protect the drainages. Construction activities in and near the drainages and along the lake shoreline could discharge sediment and other pollutants into the water, affecting water quality. The placement of fill (including structures) in waters of the United States would require a Section 404 permit from USACE and a Section 401 water quality certification from the RWQCB; these permits would be obtained prior to construction. Disturbance of more than 5 acres would also require coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity. Preparation of a SWPPP, implementation of BMPs,

and compliance with these permits would ensure minimal long-term impacts to the drainages and water quality from trail rehabilitation (Mitigation Measure 4). Some BMPs for erosion control would be implemented as part of the proposed action to minimize construction-related erosion impacts.

The trail design would reduce the longer term potential for trail users to disturb soils along the drainages and reduce the discharge of sediment into the lake from trail use and erosion. The slope of the trail would allow for surface runoff across the trail to prevent water from ponding on the trail. As the trail becomes more compacted by trail use, surface runoff would be less likely to carry sediment and erode the trail. Once compacted, the runoff rate across the trail may increase slightly, resulting in increased runoff along the shore of the lake; this could increase the creep rate of the currently inactive landslide in the southern portion of the study area (Tate 2009), but it is not expected to pose an issue for trail users. The wet crossings over the drainages would allow flow through the drainages to continue into the lake. The trail would also not create a flood hazard for users because of the highly regulated nature of the lake and installation of structures to allow drainage crossings.

Mitigation Measure 4. Water Quality Protection Measures

The appropriate permits will be obtained prior to construction to ensure compliance with the Clean Water Act and protection of water quality during construction. A Section 404 permit would be necessary for fill of wetlands and drainages (waters of the United States) and would likely consist of coverage under a Nationwide Permit. Water quality certification in compliance with Section 401 of the Clean Water Act would also be necessary. Coverage under the state General Permit as part of the National Pollutant Discharge Elimination System program (Section 402 of the Clean Water Act) would also be required. Compliance with the terms and conditions of these permits will ensure adequate protection of water quality in the drainages and Lake Berryessa.

The BMPs and other measures identified in the SWPPP should satisfy the requirements of the other applicable permits. The BMPs should be consistent with EPA's storm water BMPs for construction. The plan will need to be kept on the construction site at all times and will be implemented throughout the construction phase. Typical BMPs may include, but may not be limited to:

- use of erosion control measures that use sediment traps, barriers, covers, or other methods approved by the RWQCB;
- recommendations for mulching, seeding, or other suitable erosion stabilization measures as approved by the RWQCB;
- plans for appropriate deposition and storage of excavated and stockpiled material;
- requirements for refueling vehicles away from drainages and Lake Berryessa; and
- covering all stockpiles of fill material during extended periods of rain.

Cumulative Impacts

Reclamation is in the process of implementing its Visitor Services Plan to improve recreation opportunities at Lake Berryessa. The VSP ROD identifies a number of actions at the lake to expand or modify existing facilities and provide new recreation opportunities. Some of these improvements include:

- modification of Camp Berryessa (formerly used as a Boy Scout camp) to serve as an Environmental Education and Group Camp area;
- removal of more than 1,300 trailers and mobile homes on federal land to provide more opportunities for short-term public use;
- new concession contracts and development at the concession areas;
- construction of a regional trail system for non-motorized recreation; and
- improvement of day use areas to meet recreation needs and provide Americans with Disabilities Act compliance.

The proposed action is a component of the VSP ROD and will become part of the regional trail system. The North End Trail rehabilitation, however, would be implemented independent of the other trails that may also become part of the regional trail system. Therefore, construction of the entire regional trail system was not specifically evaluated in this EA.

Although the proposed action may have individually minor impacts, the effects of all actions at Lake Berryessa could result in cumulatively significant impacts. The environmental effects of the VSP were evaluated in the VSP EIS, which concluded that construction and development impacts would result in less than significant impacts with implementation of standard BMPs and that recreation impacts would be significant and unavoidable because of the need to cancel concession contracts (not applicable to the proposed action). The cumulative contributions of all recreation projects at Lake Berryessa on greenhouse gas emissions would contribute to climate change, but they would not be expected to contribute substantially because of the nature of the projects (recreation) and relatively small amount of construction that would be necessary. Based on the conclusions in the VSP EIS and this EA, the cumulative impacts of the proposed action and other recreation improvements at Lake Berryessa would not be significant for any resource topic discussed in this EA. Implementation of standard BMPs and mitigation measures identified in the VSP ROD and this EA would ensure that cumulative impacts on resources, such as sensitive biological resources, cultural resources, air quality, climate change, water quality, and soils, are not significant.