

Chapter 3

Affected Environment and Environmental Consequences

Introduction

This chapter describes the affected environment and discusses the environmental consequences of the proposed action and the no-action alternative. The description of the affected environment focuses on the study area, defined as a 30- to 100-foot corridor along the existing and proposed trail, approximately 7.3 miles long. The analysis of environmental consequences focuses on issues associated with the North End Trail and resources that could be affected (see Table 1, **bolded** topics are described in more detail following the table). Some resource topics are not analyzed or described in detail, as identified in Table 1.

The cumulative effects of implementing the proposed action and other recreation projects in the Lake Berryessa area are analyzed at the end of this chapter.

Table 1. Summary of Resource Topics Considered in This EA

Resource Topic	Analyzed in the EA?	Comments
Agricultural Resources	No	No important farmland exists in the vicinity of the North End Trail. Agricultural uses occur nearby (primarily grazing) and are discussed under Land Use.
Air Quality	Yes	Construction-related emissions would temporarily affect air quality in the local area, but regional effects are not anticipated.
Biological Resources	Yes	Migratory birds, valley elderberry longhorn beetle, and habitat, including wetlands, are not likely to be adversely affected by the proposed action.
Cultural Resources	Yes	No historic properties would be affected by the proposed action.
Environmental Justice	No	The North End Trail will remain open to public use without discrimination, and the impacts of the proposed action would not disproportionately affect low-income or minority populations.
Indian Trust Assets	Yes	The proposed action does not have the potential to affect Indian Trust Assets (Patricia Rivera, Reclamation, pers. comm., September 29, 2010). The nearest Indian Trust Asset is Rumsey Rancheria approximately 15 miles north-northeast of the study area.

Table 1. Summary of Resource Topics Considered in This EA

Resource Topic	Analyzed in the EA?	Comments
Land Use	Yes	Trail use could conflict with agricultural operations in the vicinity, but other land use conflicts are not anticipated.
Mineral Resources	No	No important mineral resources are known or anticipated to occur in the study area.
Noise	Yes	Trail users and other visitors to the trail area could be affected by construction and operation noise.
Public Health and Safety	Yes	The existing North End Trail poses safety concerns for the public, and the proposed action would improve trail conditions to reduce such concerns.
Public Services	No	The proposed action would not be expected to increase the demand for public services in the area or otherwise affect public services.
Recreation	Yes	The proposed action would improve recreation opportunities at Lake Berryessa and would be consistent with the VSP for the area. An increase in trail use could occur.
Socioeconomics	Yes	An increase in recreation use of the area could contribute to the local economy.
Soils	Yes	Erosion and small-scale landslides create hazards along the shore of Lake Berryessa, and the relocation of the trail would alleviate such safety hazards.
Transportation and Circulation	Yes	Construction and recreation traffic would increase use of the local roads that provide access to the North End Trail.
Utilities	No	The proposed action would not affect utilities, including a power line along Berryessa-Knoxville Road.
Visual Resources	Yes	The North End Trail and its users may be visible from some viewpoints around Lake Berryessa, which is a scenic area.
Water Resources	Yes	The proposed action would involve construction activities in drainages that cross the North End Trail and near the shore of Lake Berryessa, which could affect water quality and flow conditions.

Air Quality

Affected Environment

Napa County is located in the San Francisco Bay Air Basin (SFBAB), where air quality is monitored and regulated by the Bay Area Air Quality Management District (BAAQMD). Air quality in the SFBAB is heavily influenced by weather conditions, particularly climate and wind patterns. Summers in the SFBAB are hot and dry in the inland areas, and winters are typically cool and wet. In summer, a northwest wind originates off the coastline and is drawn inland through the Golden Gate and over the lower portions of the San

Francisco Peninsula, carrying pollutants from the San Francisco area. The mountains that surround Lake Berryessa are effective barriers to the prevailing northwesterly winds, but an up-valley wind frequently develops during warm summer afternoons that draws air from the San Pablo Bay. The wind patterns and topography contribute to the buildup of high concentrations of emitted pollutants in the Bay Area (Bay Area Air Quality Management District 1999).

The U.S. Environmental Protection Agency (EPA) and the State of California have designated National and California Ambient Air Quality Standards, respectively, to protect public health and welfare. The California standards are more stringent than the national standards. Because of the buildup of high concentrations of pollutants, Napa County is designated as nonattainment for ozone under the national standards and is designated nonattainment for ozone, PM_{2.5}, and PM₁₀ under the California standards. The nonattainment status means that the concentration of pollutants in the air exceeds the national or California standards.

Air quality is monitored at one location in Napa County, the Napa-Jefferson Avenue monitoring station, approximately 15 miles south of Lake Berryessa. This monitoring station records measurements for ozone (hourly) and respirable particulate matter (PM₁₀). Occasionally during hot summer afternoons, ozone concentrations approach and sometimes exceed the California standard. According to monitoring data from 1990 to 2000, Napa County experienced two days that exceeded the one-hour national ozone standard and 15 days that exceeded the California one-hour standard (California Air Resources Board 2007). The highest PM concentrations occur in the winter, particularly during evening and nighttime hours. The county experienced seven days that exceeded the California PM₁₀ measured standard between 1990 and 2000; the federal standard was not exceeded.

In Napa County and the vicinity of the study area, the primary sources of pollutants are motor vehicles, combustion products from fuel, consumer products, wood smoke, and construction-related dust (Bay Area Air Quality Management District 2000). Persons sensitive to air pollutants in or near the North End Trail area include trail users and other recreationists; no residential or other sensitive uses occur nearby.

Environmental Consequences

No-Action Alternative

Air quality impacts under the no-action alternative would be limited to emissions from maintenance and recreationist vehicles traveling to Lake Berryessa and the North End Trail. Maintenance activities would be limited to occasional vegetation removal efforts, which would likely be performed by hand and would not generate emissions, and maintenance worker vehicles would generate a small amount of emissions during their travel to and from the trail. Vehicle emissions from recreationists using the trail would be reduced

compared to current conditions because of an anticipated reduction in trail use. Air quality impacts under the no-action alternative would not contribute substantially to Napa County's existing nonattainment status.

Proposed Action

Air quality impacts associated with the proposed action would result from construction-related emissions, dust, and vehicle emissions from trail users. Construction activities would result in the temporary generation of reactive organic gasses (contributing to ozone), oxides of nitrogen, and PM₁₀ emissions from site preparation and compaction and from motor vehicle exhaust associated with construction equipment, employee commute trips, and material transport. The primary equipment used for trail rehabilitation would be a SWECO trail dozer, which is a small bulldozer designed for trail construction. Emissions from the trail dozer and dust from ground disturbance in combination with the motor vehicle exhaust would be minimal and localized, and they would not affect the air quality of the greater SFBAB or contribute substantially to the county's existing nonattainment status.

Trail use is predicted to increase with the improvements to the North End Trail, resulting in increased visitation to the northwest shore of Lake Berryessa; the degree of increase cannot be predicted. Some new trail users may include recreationists already using the Lake Berryessa area; some, such as bicycle enthusiasts, may be new to the area. The increased vehicle trips to this area would increase mobile source emissions in the local area by a small quantity, but the emissions are not expected to affect the air quality of the greater SFBAB or contribute substantially to the county's existing nonattainment status.

An increase in mobile source emissions from construction vehicles and trail users would contribute to greenhouse gas emissions and, incrementally, to global climate change. However, the emissions associated with the proposed action by itself would not have a noticeable effect on global climate change. The emissions resulting from the proposed action in combination with other project emissions in the area could contribute cumulatively to global climate change; this impact is discussed in the cumulative impact section at the end of this chapter.

Biological Resources

Affected Environment

The existing North End Trail follows the northwest shore of Lake Berryessa and crosses through annual grasslands, oak woodlands, and several drainages and wetlands. These habitats support a diversity of plant and wildlife species. Portions of the habitats in and near the study area have been heavily disturbed by roads, trails, and other human activities, which has resulted in substantial populations of invasive and weedy plants. No plant species listed under the federal Endangered Species Act or other special-status plants are expected to

occur in the study area, based on a lack of suitable habitat and the results of a project-specific floristic survey conducted in April and May 2008 (MUSCI Natural Resource Assessment 2008). The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), which is listed as threatened under the federal Endangered Species Act, may occur on elderberry shrubs (*Sambucus* spp.) in the project vicinity. No other animals listed under the federal or state Endangered Species Acts are expected to occur in or near the study area based on the types of habitat present and the results of field surveys in April and May 2008.

Common plants in the annual grasslands include ripgut brome (*Bromus diandrus*), soft brome (*B. hordeaceus*), black mustard (*Brassica nigra*), medusahead grass (*Taeniatherum caput-medusae*), yellow star thistle (*Centaurea solstitialis*), and wild oat (*Avena fatua*). Overstory vegetation in the oak woodlands is predominately composed of valley oak (*Quercus lobata*), with an occasional interior live oak (*Q. wislizenii*), blue oak (*Q. douglasii*), and grey pine (*Pinus sabiniana*). One elderberry shrub was identified in the study area during surveys in August 2010 (Figure 4), and other elderberry shrubs may occur in the vicinity. The understory vegetation consists of annual grasses and forbs similar to those in the grasslands. Tamarisk (*Tamarix parviflora*), an invasive plant, occurs near the shoreline of Lake Berryessa outside of the study area, including in other areas of the Putah Creek drainage, and yellow star thistle, another invasive plant, is common throughout the area.

Two small wetlands, a seasonal wetland and a wetland seep, are present in the study area (Figure 5) (North State Resources 2008). The seasonal wetland is approximately 0.011 acre within the study area and is located along an ephemeral drainage near the southern end of the study area. The seasonal wetland is characterized as a localized, topographic depression that ponds water during the winter months and seasonally supports tall flatsedge (*Cyperus eragrostis*), spike rush (*Eleocharis macrostachya*), and perennial ryegrass (*Lolium perenne*). The wetland seep is approximately 0.003 acre within the study area and is located along a moderately sloped hillside approximately 0.75 mile north of the southern end of the study area. The wetland seep is formed from a seasonal groundwater discharge point that supports a growth of cattail (*Typha latifolia*).

The habitats in and surrounding the study area provide nesting, foraging, and resting habitat for a variety of birds, such as bald eagle, osprey (nesting), mallard, Canada geese, red-winged blackbirds, acorn woodpecker (nesting), and killdeer (nesting) (MUSCI Natural Resource Assessment 2008). Elderberry shrubs provide habitat for, and are the host plant of, the valley elderberry longhorn beetle, a species federally listed as threatened. Downed branches and litter at the southern end of the study area provide upland game habitat, especially for quail; however, this habitat is not considered suitable for game bird nesting. Numerous opportunities for birds, including migratory birds, to nest in shrubs and trees are available in the woodland and brush habitats in and

near the study area. During field surveys in April and May 2008, an osprey nest was observed in a blue oak near the lakeshore adjacent to a portion of the existing trail. Ospreys, like other birds of prey and migratory birds, are protected under the Fish and Game Code and the Migratory Bird Treaty Act. The study area also provides movement corridors between the upland and riparian areas, particularly for reptiles and mammals.

Environmental Consequences

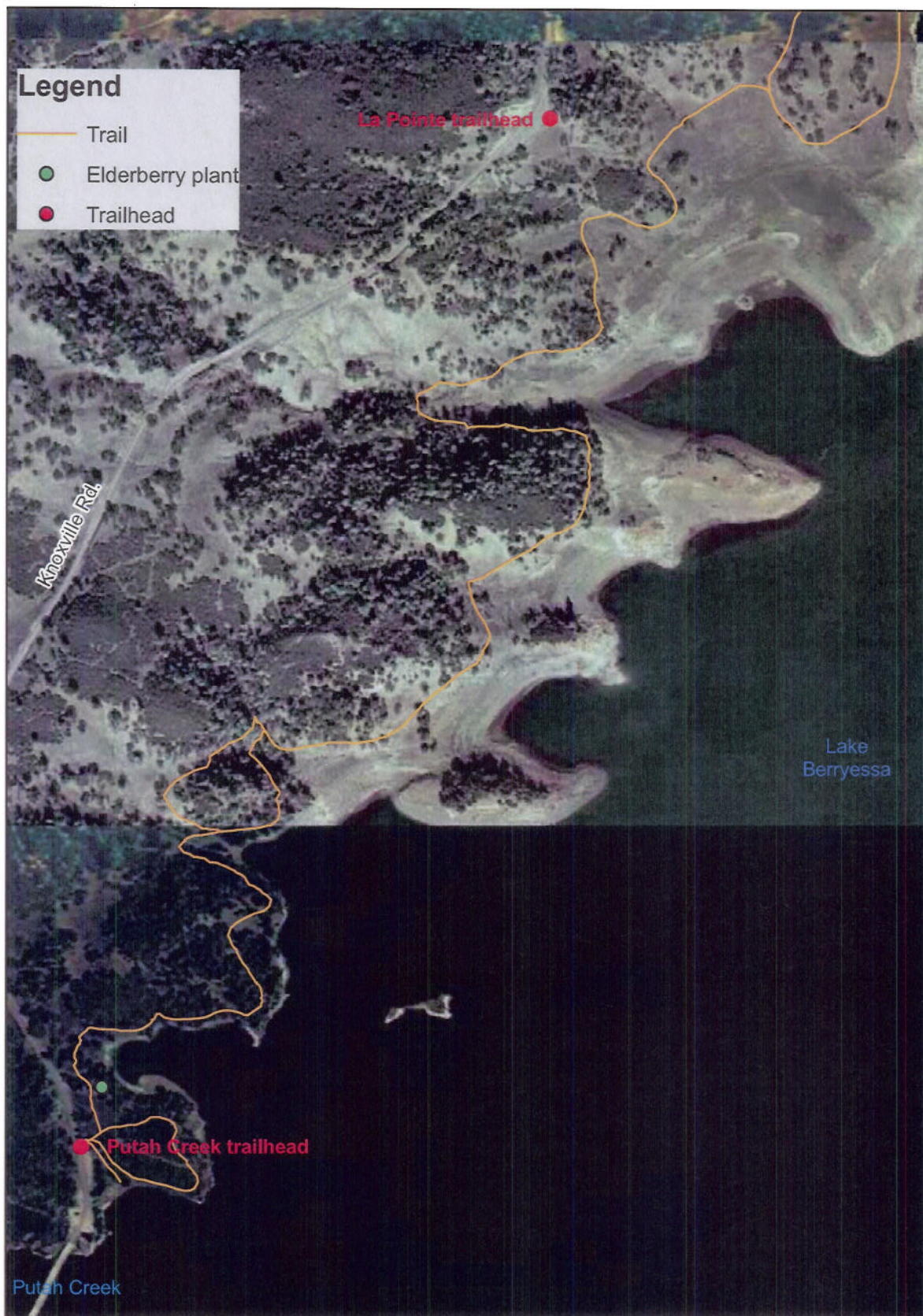
No-Action Alternative

Impacts on wildlife and plants under the no-action alternative would be similar to those from the current disturbance caused by trail use and maintenance. Trail users may disturb wildlife as they hike the trail and may trample vegetation along the trail or in adjacent grasslands and oak woodlands. Because of the poor quality of the trail in some areas, trail users may continue to create their own trails in more accessible areas to avoid the eroded or overgrown portions of the trail. Trail maintenance would continue on an irregular basis to remove overgrown vegetation from the trail and could disturb nearby wildlife. Ongoing disturbance would continue to provide a means for invasive plants to expand their populations and out-compete native or more desirable plants.

Proposed Action

Under the proposed action, trail construction and increased trail use could increase disturbance to wildlife, particularly nesting birds. Trail construction would require vegetation removal to construct the new alignment, but the old segments of the trail would be restored or allowed to revert to a natural state. With a defined trail alignment and safer hiking conditions, hikers would be less likely to disturb vegetation outside of the trail alignment. No special-status plants are known to occur in the study area; therefore, no impacts on special-status plants are anticipated. Section 7 consultation under the Endangered Species Act was conducted and FWS concurred that the proposed action is not likely to adversely affect the valley elderberry longhorn beetle, with proper mitigation in place. No other special-status wildlife are expected to be affected.

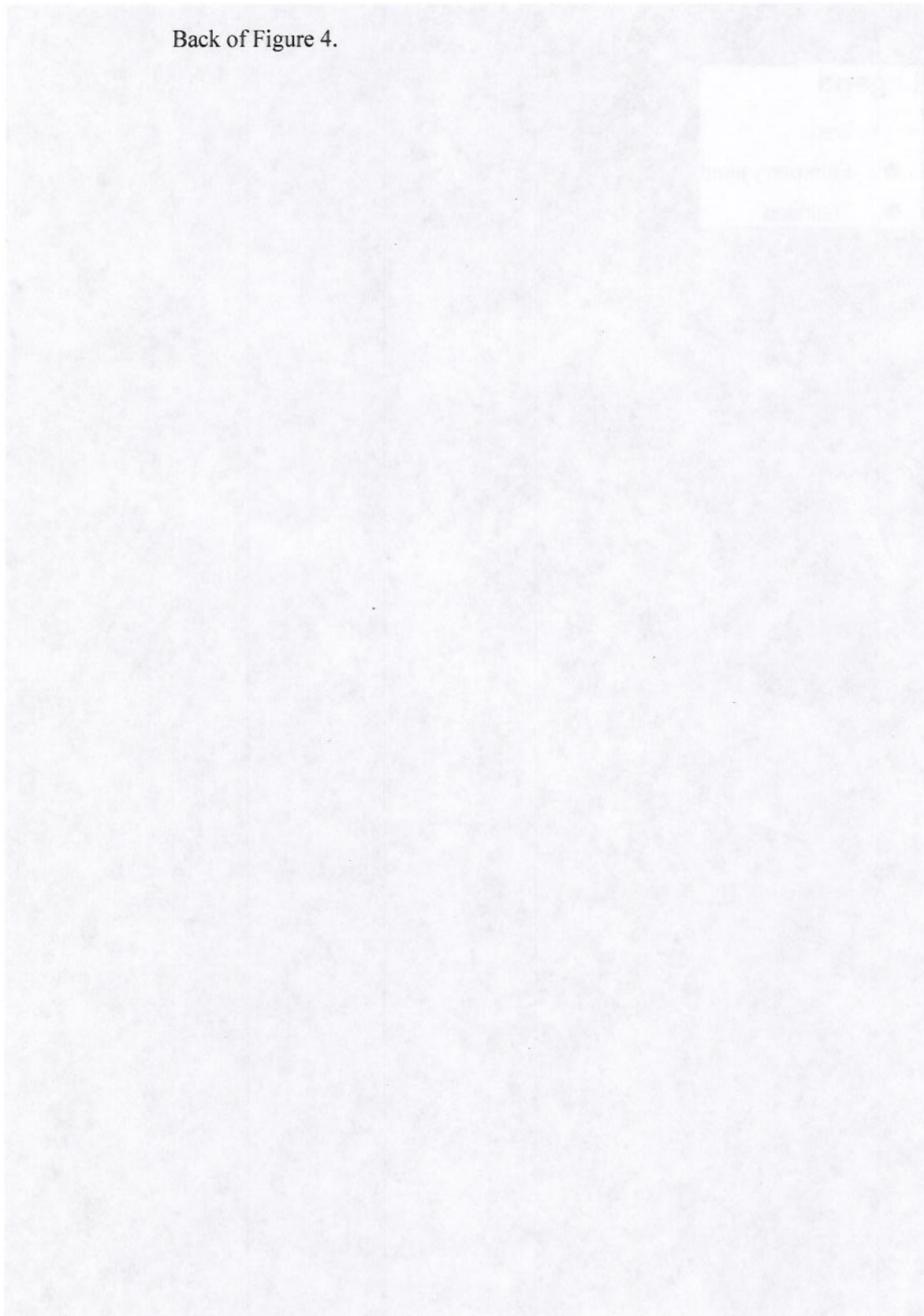
Vegetation removal activities would disturb approximately 7 acres, which would affect mostly grasslands and invasive plants. Two small wetlands could be affected by the trail crossings. The trail could be aligned to avoid the wetland seep, but a bridge would be required over the seasonal wetland and associated ephemeral drainage. The bridge would span most of the wetland, but construction of the supports on both ends could result in impacts to the edges of the wetland (less than approximately 0.005 acre of impacts). The bridge would allow water flow through the wetland and associated drainage and would not likely result in indirect effects on downstream vegetation (i.e., from reduced water supply). Compliance with a Clean Water Act permit would ensure minimal adverse impacts on wetlands and drainages (see Water Resources discussion below).



J. Gifford 09.13.10

Figure 4. Elderberry Shrub Location

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Prepared by:
North State Resources, Inc.
 1321 20th Street
 Sacramento, CA 95814 Phone (916) 446-2566
 Fax (916) 446-2792 www.nsrnet.com

Prepared for:
 U.S. Bureau of Reclamation,
 Central California Area Office,
 Lake Berryessa Field Office
 6620 Knoxville Road
 Napa, CA 94558

Notes:
 This delineation of waters of the U.S., including wetlands, is subject to verification by the Corps. NSR advises all parties to treat the information contained herein as preliminary until the Corps provides written verification of the boundaries of their jurisdiction.

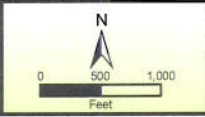


Figure 5
Waters of the United States, Including Wetlands
 Lake Berryessa North End Trail Project

Rehabilitation of North End Trail at Lake Berryessa

Back of Figure 5.



The trail would be aligned to avoid tree removal to the extent feasible, but trees smaller than 10 inches in diameter at breast height and branches extending into the trail corridor would be pruned or removed to provide a safe trail corridor for hikers and bikers. The retained trees would provide shade and cover for trail users and would protect nesting habitat for various birds. The defined trail alignment, implementation of BMPs during construction, and regular trail maintenance would reduce the potential for invasive plants to grow along the trail. The trail alignment would also be designed to avoid elderberry shrubs that may support the valley elderberry longhorn beetle to avoid adverse impacts on any individuals that may be present on the bushes and their habitat. Other measures required to ensure protection of the shrubs; these are identified in coordination with the U.S. Fish and Wildlife Service (USFWS) and include the measures identified in Mitigation Measure 1.

Construction activities could disturb wildlife in the area and could have an adverse effect on nesting birds. Use of a SWECO or similar bulldozer for trail construction would result in loud noises and possible ground vibrations that could temporarily disturb wildlife. Increased human presence and activity in the area could also disturb wildlife during construction and operation. Removal of dense ground vegetation could remove nesting habitat for ground-nesting birds, mammals, and other wildlife. Activities in proximity to active nests, such as osprey nests near the shore, could disturb the nesting birds and cause adults to abandon their young if activities occur during the nesting period (generally March to August). Implementation of measures to prevent adverse effects on nesting migratory birds would ensure protection of the birds and compliance with the Fish and Game Code and Migratory Bird Treaty Act (Mitigation Measure 2).

Increased trail use would increase human presence in the study area and could increase disturbance to wildlife. Existing disturbance is limited to occasional noise and activity associated with trail use, and a slight increase in the level of disturbance would not be expected to substantially affect wildlife already acclimated to human presence. Some wildlife likely adapts to human presence and would not be disturbed by typical trail use. Wildlife that cannot adapt would likely avoid the habitats in proximity to the trail or use them when the trail is not in use. The trail would not create a barrier to movement corridors, and wildlife would continue to be able to access the lakeshore from upland areas.

Mitigation Measure 1. Valley Elderberry Longhorn Beetle Conservation Measures

Reclamation will implement the following conservation measures to prevent adverse impacts on the valley elderberry longhorn beetle or its host plant, the elderberry shrub:

- The elderberry shrub will be flagged or fenced by a biologist according to the elderberry survey that was conducted by Reclamation to ensure easy identification.
- Maintenance crews will be briefed on the need to avoid the elderberry shrub.
- No vehicles will enter within a 20-foot buffer zone of the elderberry drip line.
- If possible, construction activities within 100 feet of elderberry shrubs will occur only between July through February, avoiding the season of emergence (March to June) of the valley elderberry longhorn beetle.

Mitigation Measure 2. Nesting Migratory Bird Avoidance Measures

Construction activities, including vegetation removal and other activities that could disturb nesting birds, should be scheduled during the non-nesting period (September to February). Removal of vegetation and potential nesting substrate (e.g., bushes, trees, grass, buildings, and burrows), in particular, should be scheduled prior to the onset of the nesting season (March 15) to help preclude nesting.

If activities cannot be scheduled during the non-nesting period, the following measures are recommended to protect nesting migratory birds:

- A qualified specialist should conduct pre-construction surveys no more than 2 weeks prior to the initiation of construction along the proposed trail alignment (based on the final design) and a 500-foot corridor along the trail (250 feet on each side of the trail) to ensure that no nests of migratory birds would be disturbed during construction. The survey should focus on suitable trees and other vegetation that could provide nest sites.
- Any observed breeding or nesting activity should be documented, and the location(s) of active nest site(s) should be recorded. If no breeding or nesting activity is documented, no further action is necessary during the nesting season.
- If an active nest is found, a construction-free buffer zone should be established around the nest. The size of the buffer zone may be determined by a specialist in consultation with USFWS.
- The buffer zone should remain in place until either the end of the nesting season (end of August) or a qualified specialist determines that the nest is no longer active.

Cultural Resources

The Anthropological Studies Center at Sonoma State University conducted a cultural resources study of the area of potential effect in compliance with Section 106 of the National Historic Preservation Act. The area of potential effect was defined as a 100-foot corridor along the existing 7-mile trail, consisting of approximately 79 acres (Guerrero and Praetzellis 2010). This section summarizes the results of the study.

Affected Environment

Evidence of prehistoric uses in the northern Coast Ranges dates to the Middle (3000 to 500 B.C.) and Upper Archaic (500 B.C. to A.D. 1000) periods (Milliken et al. 2007). During the Middle Archaic, people had a localized forager lifestyle and began to use new ground stone technology. The Upper Archaic people moved toward a more sedentary lifestyle with acorn processing and storage and use of the mortar and pestle, bone tools and ornaments, and basketry awls. During the Emergent Period (A.D. 1000 to 1800), which is generally before Native American contact with Americans and Mexicans, central villages were being established with evidence of rock art, stone tools, midden soils, dietary bone and shell, and a diversity of artifacts in a single location.

The project area is in the former Patwin territory, which encompassed a portion of the Sacramento River, surrounding grassland plains, and lower hills of the eastern Coast Ranges (Johnson 1978). The Patwin lived in large seasonal villages concentrated along the river and along Putah and Cache creeks and were predominantly a fishing and hunting-gathering society. American and Mexican settlers increased in the area during the 1850s and 1860s, and the Patwin were either forced to assimilate into mainstream culture as laborers or moved onto reservations.

With the increase of settlers to the area, the nearby town of Monticello was founded in 1866 (U.S. Bureau of Reclamation 2009). The town provided commercial services for people in the area. A four-horse stage line that ran from Knoxville to Napa passed through the town. By 1963, Lake Berryessa was created as part of the Solano Project to supply water for agricultural uses in the area and to supply local communities with a source of water. The lake likely inundated prehistoric and historic resources that were present along the former creek alignment and in the Berryessa Valley; the Putah Creek Bridge is one known resource submerged under the lake. Recreational use of the Lake Berryessa area began in 1974.

Six prehistoric cultural resources have been previously recorded in the project vicinity, including four sites that extended into the project area, and two historic-era resources were recorded in January 2010 (Guerrero and Praetzellis 2010). The prehistoric resources contained cobble tools with no apparent midden, and two sites contained flakes. These resources were likely intensively

surface collected and have been affected by environmental conditions due in part to the creation of Lake Berryessa, leaving minimal to no evidence of the locations of the sites on the surface. The historic-era resources consist of the historic-era Berryessa-Knoxville Road and an unnamed historic road that intersected Berryessa-Knoxville Road in the northern portion of the project area and formerly passed through the current location of the lake. None of the recorded resources were determined eligible for listing on the National Register of Historic Places. No known Native American cultural resources have been documented in the project area (Guerrero and Praetzellis 2010).

Environmental Consequences

No Action Alternative

Ongoing effects from environmental conditions, such as erosion along the lake and changes in vegetative structure, would continue to occur to known cultural resources in the vicinity of the project area. Occasional vegetation clearing is not expected to adversely affect cultural resources. No construction or ground disturbing activities would occur under the no-action alternative; therefore, no additional impacts on cultural resources would occur.

Proposed Action

Under the proposed action, no historic properties would be affected. Little evidence remains of the known prehistoric cultural resources in the project area and immediate vicinity; therefore, no known resources on the surface would be adversely affected. The two known historic-era resources would not be affected by trail construction because they would be avoided by the trail alignment.

Because of the rich cultural history of the area and documented resources in and near the project area, previously undiscovered resources may be exposed during ground disturbance associated with trail construction. To minimize adverse effects on cultural resources, Reclamation would comply with applicable laws and regulations, such as the Native American Graves Protection and Repatriation Act of 1990 and the Archaeological Resources Protection Act of 1979 as amended, and implement Mitigation Measure 3 to ensure minimal impacts on resources or remains discovered during construction.

Mitigation Measure 3. Cultural Resource Protection Measures

Prior to construction activities, the work crews and their supervisors should undergo a training program that describes how to recognize archaeological remains and the protocol that should be carried out if suspected resources are uncovered. If cultural resources are discovered during construction, work in the vicinity of the find should be halted, and the Reclamation archaeologist should be contacted to assess the find. Additional measures may be identified to protect or recover the resource based on the direction of the archaeologist.

If human remains are encountered during construction of the trail, work should halt in the area of the discovery, and the appropriate federal official should be

notified immediately. At the same time, the Reclamation archaeologist should be contacted to evaluate the situation. If the remains are of Native American origin, or if funerary objects, sacred objects, or items of cultural patrimony are encountered, Reclamation will follow the guidelines and requirements of the Native American Graves Protection and Repatriation Act of 1990 and the Archaeological Resources Protection Act of 1979 as amended.

Land Use

Affected Environment

Land Use Setting

Lake Berryessa is located in a predominately rural, natural open space area surrounded by mountains. Land uses around the lake include habitat conservation, recreation, agriculture (grazing), open space, and some commercial uses. The lake is operated by Reclamation, which manages reservoir resources through concurrent jurisdiction with federal, state, and county agencies and private entities. Federal lands total approximately 28,916 acres, including 19,250 acres of open water and 9,666 acres of the lakeshore and adjacent upland areas.

The study area is currently used for recreation purposes and encompasses the existing North End Trail. The surrounding area is primarily open space with agricultural uses on the west side of Berryessa-Knoxville Road.

Land Use Planning

Reclamation and other agencies have prepared land use and resource management documents to provide direction on the management of Lake Berryessa and its resources. The Lake Berryessa RAMP is an update to an older public use plan that provides details on the need for adequate public use facilities and direction on preventing resource degradation. The VSP EIS identifies and assesses various management alternatives for the redevelopment and management of visitor services (commercial and non-commercial) to better serve traditional, short-term, non-exclusive, and diverse outdoor recreation opportunities at Lake Berryessa. The Napa County General Plan provides policy-level direction for land uses throughout the county, with guidance on growth management and resource protection.

The RAMP designated five land use classifications at Lake Berryessa to balance the different types of uses and levels of development (U.S. Bureau of Reclamation 1992). The study area is in a designated Class III – Dispersed Recreation Area, which is defined as a minimally developed area with road access, minimal sanitation facilities, road pullouts, and trails; lands with such designations are intended for less intensive use with no major improvements. Class III is a predominately natural setting, with a moderate degree of privacy.