



Draft

Warner Valley Comprehensive Site Plan Draft Environmental Impact Statement

August 2009

Lassen Volcanic National Park
Mineral, California



WARNER VALLEY
L A S S E N V O L C A N I C N A T I O N A L P A R K

Warner Valley Comprehensive Site Plan

Draft Environmental Impact Statement

**United States Department of the Interior
National Park Service
Lassen Volcanic National Park
Plumas County, California**

August, 2009

This Draft Environmental Impact Statement (DEIS) was prepared in accordance with the Department of Interior National Environmental Policy Act (NEPA) and the National Park Service NEPA guidelines (DO-12). This document has been prepared because actions proposed as part of the Draft EIS may be a major federal action significantly affecting the quality of the human environment.

The National Park Service (NPS) is proposing the Warner Valley Comprehensive Site Plan to address natural and cultural resource conflicts and to improve circulation and parking in Warner Valley. The current NPS planning effort has several primary purposes: (1) improvements to the visitor experience and safety through improvements to infrastructure and relocating infrastructure so it is less visible; (2) ecological restoration of the larger Warner Valley fen and wetland areas; (3) repair or removal of Dream Lake Dam and restoration of the damaged riparian/wetland complex; and (4) removal of the non-contributing features from Drakesbad Guest Ranch Historic District.

Alternative 2 (the agency-preferred and environmentally-preferred alternative) includes the following components:

- (i) Ecological restoration of wetlands throughout Warner Valley along with permanently filling ditches with appropriate soil in Drakesbad Meadow; (ii) Creating a concession housing and service center outside of the Drakesbad Guest Ranch Historic District composed of tent cabins surrounding a single-story bathhouse building; (iii) Removing Dream Lake Dam and allowing the area to revert to a riparian/wetland complex.

Two additional alternatives are analyzed in this EIS: *Alternative 1*, the No Action Alternative would continue current management practices; *Alternative 3* includes: (i) Restoration of Warner Valley fen through the damming of ditches; (ii) Creating a concession housing and service center outside the Drakesbad Guest Ranch Historic District composed of a two-story dormitory building with bathrooms; (iii) Re-constructing Dream Lake Dam to Bureau of Reclamation engineering standards.

For each alternative action, the Park analyzed the potential environmental impacts that would likely occur, divided into the following categories: Geologic Resources and Hazards; Hydrology and Water Quality; Vegetation and Wildlife, Wetlands and Special-status Species; Soundscapes; Cultural Resources; Visitor Experience; Public Health and Safety; Transportation; Scenic Resources; and Park Operations and Facilities.

The Park is releasing this Draft EIS for public review with all written comments due no later than November 21, 2009. After this date, the Park will consider all public comments, prepare responses to substantive comments, and make any necessary changes to the EIS. A Final EIS will be released for a minimum 30-day no action period, after which a Record of Decision may be prepared. Written comments on this Draft EIS should be sent to:

Superintendent, Lassen Volcanic National Park, P.O. Box 100, Mineral, California, 96063 (or may be transmitted electronically to LAVO_Planning@nps.gov).



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Mineral, California

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CHAPTER 1

Purpose and Need

1.1 Background

The National Park Service (NPS) is considering a Comprehensive Site Plan for Warner Valley at Lassen Volcanic National Park (Park). Lassen Volcanic National Park is a 106,372-acre park located in four California counties, including Plumas, Lassen, Shasta, and Tehama.¹ This Environmental Impact Statement (EIS) addresses the Warner Valley Comprehensive Site Plan (Plan). Warner Valley is located in the south central part of the park and is the location of Drakesbad Guest Ranch, a concession-operated lodging facility. The Warner Valley includes Dream Lake Dam, which impounds an approximately two-acre lake and is a contributing resource (structure) of the historic district. The center of Warner Valley features a large meadow (Drakesbad Meadow) that is one of the largest known fens in the western United States. Warner Valley also features a campground and several trails, including the Pacific Crest Trail that traverses the valley.

This Plan was developed to address natural and cultural resource conflicts and to improve circulation and parking in Warner Valley. The Plan is focused on the protection of the cultural landscape at Drakesbad Guest Ranch and the historic and cultural resources in Warner Valley. In particular, the Plan includes protection measures for unique natural resources including sensitive wetlands and the geothermal features in the surrounding areas. The Plan also addresses visitor access, facilities, and programs.

1.2 Purpose and Need for Federal Action

The NPS is considering a comprehensive site plan for Warner Valley at Lassen Volcanic National Park, which is needed to address natural and cultural resource conflicts, improve design and accessibility of the campground and to improve parking and circulation as stipulated by the Lassen Volcanic National Park's 2002 General Management Plan (GMP).

1.2.1 Purpose of the Project

The purpose of the Warner Valley Comprehensive Site Plan is to:

- Improve visitor experience through attention to educational, interpretive, and recreational opportunities in the Park and protection of wilderness values.

¹ The project area is located only within Plumas County.

- Provide a comprehensive planning effort for the Warner Valley area to effectively address visitor services, natural resource and cultural resource protection, infrastructure improvements, and sustainability and efficiency of facilities and utilities.
- Evaluate the appropriateness and adequacy of existing infrastructure with respect to the preservation of natural and cultural resources, human aesthetics, and visitor and staff safety and visitor experience.
- Protect and restore the hydrologic and biologic functions of the damaged fen wetland in Warner Valley.
- Improve trail connections and campgrounds and repair damage to sensitive resources.
- Protect public health and public and employee safety by addressing structural concerns of Dream Lake Dam.

1.2.2 Need for the Project

The need for a Warner Valley Comprehensive Site Plan arose out of a series of issues identified by Park staff and visitors. These include the following:

- Natural and cultural resource conflicts in the Warner Valley area, including the historic placement of existing facilities within sensitive wetland areas and the degradation of natural resources in Drakesbad Meadow.
- The need and desire for continued use of an historical/cultural resource while preserving that resource, following recommendations from the National Park Service's Cultural Landscape Report for Drakesbad Guest Ranch.
- Improvement of visitors' visual experience.
- Inefficient infrastructure including utilities and other systems that are neither sustainable nor efficient.
- Insufficient and substandard concession employee housing.
- Inadequate storage space for operations at Drakesbad Guest Ranch.
- Pollutants in the meadow due to effluent from the stock also seed from feed for the stock feed introduces non-native species into the meadow.
- Needed improvements to trail connections, trailheads, and way finding.
- Traffic safety concerns on Warner Valley Road, including a blind curve and slippery road base.
- Inadequate day use/trailhead parking. The parking is an inadequate size and is located in a sensitive wetland area.
- Design problems concerning the Warner Valley campground – bifurcated, dusty, and infringing on the Hot Springs Creek natural resources through proximity of campsites to steep slopes adjacent to the creek.
- Motor vehicle safety concerns at the entrance due to poor location of the fee station.

1.2.3 Purpose and Significance of the Park

Lassen Volcanic National Park was established by an Act of Congress in 1916 “for recreation purposes by the public and for the preservation from injury or spoliation of all timber, mineral deposits and natural curiosities or wonders within said park and their retention in their natural condition...and provide against the wanton destruction of the fish and game found within said park and against their capture or destruction....”²

Lassen Volcanic National Park is a unique example of a dynamic geologic landscape and is of national significance. Lassen Peak erupted over a six-year period between 1914 and 1921. Lassen Peak is one of the largest plug dome volcanoes in the world. The park is unique in that it also preserves, in a relatively small geographic area, examples of the three other types of volcanoes recognized by geologists: shield volcanoes, composite volcanoes and cinder cones. The park also contains a network of geothermal resources including boiling springs, mudpots, and fumaroles.

In 1972 Congress designated 75 percent of the park (78,982 acres) as the Lassen Volcanic Wilderness. Appropriate recreation on lands managed for wilderness values include such activities as hiking, backpacking, horseback riding and fishing. The Wilderness Act, passed by Congress in 1964, provides guidance to federal agencies with respect to the management of wilderness areas. This Act restricts the construction of roads, buildings, and other man-made improvements and the use of motorized vehicles in wilderness.

In addition to natural resources, the park preserves nationally significant cultural resources including 84 historic buildings that are on the List of Classified Structures (most of which date from the Civilian Conservation Corps era), over 70 Native American archeological sites, and portions of the Nobles Emigrant Trail. The Drakesbad Lodge and the Warner Valley Ranger Station are on the National Register of Historic Places.

1.3 Planning Context

1.3.1 Applicable Plans and Policies

The following plans and policies have been reviewed for critical needs and desired future uses of the park.

- Condition Survey Report – Dream Lake Dam, November 2000
- Cultural Landscape Report for Drakesbad Guest Ranch, March 2005
- Lassen Volcanic National Park General Management Plan, June 2002
- Hydrologic Characterization and Restoration of a Mountain Fen Complex, Drakesbad Meadow, Lassen Volcanic National Park, Summer 2005

² “An Act To establish the Lassen Volcanic National Park in the Sierra Nevada Mountains in the State of California, and for other purposes.” H.R. 348, Public Act No. 184, 64th congress

- Lassen Volcanic National Park – Natural and Cultural Resource Management Plan, December 1999
- Lassen Volcanic National Park Commercial Services Plan and Environmental Assessment, Lassen Volcanic National Park, June 2005
- Lassen Volcanic National Park –Visitor Study, Summer 1999
- Title I Schematic Design Report – Dream Lake Dam, Lassen Volcanic National Park – May 2007

1.3.2 Agency Coordination and Stakeholders

The following agencies have an interest in either the environmental documentation and/or the subsequent permitting for this project.

- National Park Service
- National Park Service Water Resources Division
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Division of Safety of Dams
- Bureau of Reclamation
- State Historic Preservation Office
- Lassen National Forest

1.3.3 Public Involvement

The issues to be addressed in this draft EIS were identified through a cooperative planning process involving Lassen Volcanic National Park staff and the public. Public scoping is designed to be an early, open public process to determine the scope and significance of issues to be addressed in an environmental document for a proposed action. An informal scoping process for this EIS was initiated on June 1, 2004 with the posting of an information sign at the Drakesbad Guest Ranch Lodge and a request for scoping comments. The formal scoping process was initiated on June 24, 2005 with the publication of the Notice of Intent to prepare an EIS in the Federal Register. Originally, the Dream Lake Dam Management Plan was to be an EIS on its own; however, it was later determined that Dream Lake Dam should be included in the Warner Valley Comprehensive Site Plan since it is within Warner Valley. The Park chose to look at the entire area holistically in order to be able to accurately assess the cumulative effects of all the proposed actions. Public scoping for the original Dream Lake Dam Management Plan was initiated on April 4, 2003 with the publication of the Notice of Intent to prepare an EIS in the Federal Register. All comments received from that scoping process have been considered in this current EIS process. Public scoping meetings were held for the Dream Lake Dam Management Plan on November 4-7, 2002 in the towns of Chico, Red Bluff, Redding, and Chester. Public scoping meetings for the Warner Valley Comprehensive Site Plan were held on June 13-15, 2005 in the towns of Red Bluff, Chester, and Vacaville. Based on these meetings, public comments,

background data and studies, alternatives for different areas were developed. Additional study of the Dream Lake Dam alternatives was followed by a separate park staff workshop for Dream Lake Dam alternatives assessment in June 2008 using the Choosing by Advantages (CBA) process.

1.3.4 Planning Issues

Warner Valley is a complex system of natural and man-made features. The park's mission is "to conserve, preserve, and protect Lassen Volcanic National Park and its geological, biological, and cultural resources for the enjoyment, education, and inspiration of present and future generations."

The NPS has numerous challenges in the Warner Valley, the foremost being the relationship between people, existing development, and the natural environment. Providing design alternatives sensitive to these challenges is key to successful planning for the future of Warner Valley. No single resource can be modified without affecting one or more of the other resources. The following resource areas are relevant to the project and were developed as a result of compiled scoping session comments.

Natural Resource Issues

- Dream Lake Dam is a man-made structure that alters the natural flow of water in the area. It is in poor condition and could fail if no action is taken. Beaver in the area have caused the lake level to rise and, at times, over-top the dam. There is concern about the environmental impacts from construction equipment that both re-building and/or altering the existing dam could have on the area. Therefore, it is necessary to assess alternative methods of equipment access for all of the alternative actions.
- Consider clean-up and restoration of meadow at old trash dump at the upper end of Drakesbad Meadow.
- Consider alternative sources of power
- Plan for the control of invasive/non-native plant species.
- Protection of wetlands in day use parking area.
- Consider all potential impacts of restoring the fen, including the potential for increased mosquitoes and potentially limited access across the meadow.
- Consider alternatives to improve the natural flow of water that is currently impeded by two paths/gravel roads across the meadow.
- Consider alternatives for the corral/meadow interface, such as using engineered methods to mitigate for the horse effluent going into the meadow or utilizing a French drain to re-direct the effluent, or moving the corral to a different location.

- Assess what appears to some as increased hydrothermal activity in the Warner Valley area and consider whether or not this increased activity could be harmful to people who eat the fish in the area.
- Consider adding signs informing hikers when they have entered into the nearby wilderness area and what the rules and benefits of a wilderness area are.
- Consider impacts of chlorinated water from the pool going into the creek.

Cultural Resource Issues

- Re-establish the historic cultural landscape
- Consider alternatives that mitigate long-term adverse impact associated with the potential removal of Dream Lake Dam, a contributing resource of the historic district.
- Consider alternatives that promote compatible adaptive use when new uses are proposed or introduced within the historic district.
- Consider alternative technologies that preserve the location and character of historic trails and infrastructure while reducing impacts to natural resources.
- Consider alternatives that preserve contributing resources comprising the Drakesbad Guest Ranch including historic patterns of land use and spatial organization.
- Consider the removal of non-historic features that affect the historic viewshed, such as the volleyball court at Drakesbad Guest Ranch.

Visitor Experience and Socio-Economic Issues

Comments under this category largely were focused on visitor experience and included the following:

- Maintain the rustic experience at Drakesbad Guest Ranch (no electricity, phones, TV, internet).
- Maintain historic views of Mt. Harkness through the meadow.
- Consider options for alleviating dust and potential hazards on the Warner Valley Road.
- Evaluate the ever-increasing cost to visitors that stay at Drakesbad Guest Ranch and consider setting aside a few rooms for people of lower incomes.
- Take into account the changing demographics of California (age, race, etc.) and their needs.
- Consider campsites that accommodate small RVs and horse trailers as well as ADA-accessible sites and group sites. Ensure adequate parking areas at the campground as well as level sites for tents. Consider putting the camp host site in an open area where solar panels can be used and consider access to potable water and sewer hook-ups for the camp host site. Consider a new location for the Campground (such as the flat area near the Warner Valley Road and the park entrance).

- Consider peak summer use when designing trailhead parking.
- Consider use of interpretive signs on trails.
- Address the visual intrusion of the culverts added to the water tank road.
- Consider adding huts for winter ski-in use.
- Consider expanding and diversifying the constituent/visitor base.

Health and Safety Issues

Commentors requested the following considerations:

- Consider alternatives to address the inadequacy of the current housing for employees at Drakesbad Guest Ranch.
- Consider alternatives for parking and circulation as discussed in the 2003 GMP.
- Consider an emergency egress route out of Drakesbad Guest Ranch in case of a fire.
- Provide for clearly delineated sites at the campground.
- Address safety concerns (i.e., parking and pedestrian circulation) at the entrance self-pay station.

1.3.5 Impact Topics Analyzed in this Environmental Impact Statement

The NPS Director's Order 12 outlines Council on Environmental Quality (CEQ) National Environmental Policy Act requirements for mandatory topics under the affected environment.

The following impact areas will be analyzed in this EIS:

- Geologic Resources and Hazards
- Hydrology and Water Quality
- Vegetation, Wetlands, Wildlife and Special Status Species
- Soundscapes
- Cultural Resources
- Visitor Experience
- Public Health and Safety
- Transportation
- Scenic Resources
- Park Operations and Facilities (including energy and conservation potential)

1.3.6 Impact Topics Dismissed from Detailed Analysis in this Environmental Impact Statement

The following impact topics have been dismissed from further analysis in this EIS because they have been deemed irrelevant to the scope and context of the project.

Prime and Unique Agricultural Lands

There are no agricultural lands in the project area, nor would the proposed action under the project alternatives have indirect effects on downstream agricultural lands. Thus no discussion of this topic is necessary.

Environmental Justice

Environmental justice analyses determine whether a proposed action would have “disproportionately high and adverse human health or environmental effects...on minority populations and low-income populations.” The National Park Service and other federal agencies have determined that a disproportionately high and adverse effect on minority and low-income populations means an adverse effect that would result in either of the following two scenarios: (1) The effect is predominately borne by a minority population and/or a low-income population; and (2) The effect will be suffered by the minority population and/or low-income population and is appreciable more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

No aspect of any alternative of the Warner Valley Comprehensive Site Plan would result in disproportionately high and adverse human health or environmental effects on minority or low income populations; therefore environmental justice is not considered in this environmental assessment.

Air Quality

The National Park Service has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. The 1963 Clean Air Act, as amended (42 USC 7401 et seq.) requires federal land managers to protect park air quality while the National Park Service 2006 Management Policies address the need to analyze air quality during park planning. The Clean Air Act requires superintendents to take actions consistent with their affirmative responsibilities to protect air quality related values in Class I areas. Class I areas include all National Park Service units designated as national parks with more than 6,000 acres and all national wilderness areas with more than 5,000 acres that were in existence on August 7, 1977, and any other area redesignated as Class I by the governing state or Native American authority. The act also establishes a national goal of preventing any future and remedying any existing man-made visibility impairment in Class I areas.

Lassen Volcanic National Park extends into four counties, including Plumas, Lassen, Shasta, and Tehama, and is regulated by the Northern Sierra Air Quality Management District. Plumas

County is in attainment or is unclassified for all national ambient air quality standards. For state standards, the County is in attainment or is unclassified for state criteria pollutants except it is in non-attainment for PM₁₀ (respirable particulate matter) (NSAQMD, 2005).

Air quality-related concerns at Lassen Volcanic National Park affect visibility and vegetation. Visibility refers to the clarity of the atmosphere and is typically measured as the distance one can see at a particular location and time. The absorption and scattering of light by both gasses and particles in the atmosphere restricts visibility. Natural factors that decrease visibility include fog, precipitation, blowing dust and snow, and relative humidity above 70 percent. Human activities that reduce visibility include the combustion of fossil fuels, which transforms emissions into tiny visibility-reducing particles termed “aerosols”, and soil disturbing activities that increase the air-borne particulates.

Sensitive Receptors

Visitors to Warner Valley are not exposed to the ambient air quality over the long term, and therefore are not considered at risk to exposure to poor air quality. While the Park may attract both adolescent and elderly visitors, population groups that are sensitive to air quality, exposure to ambient air quality would be temporary and therefore these groups are not considered sensitive receptors to local air emissions.

Air Quality in Warner Valley

The Warner Valley Comprehensive Site Plan cites dust as an issue that affects the lower campground due to its location near the road. Although the preferred alternative would require use of heavy equipment during construction, emissions and dust associated with these activities would be rapidly dissipated by air drainage as air stagnation is rare at the project site. Dust mitigation measures, such as spraying the site with water in order to keep dust at a minimum, would also be implemented. Impacts on air quality would be short-term and negligible in a local and regional context.

References

National Park Service (NPS), 2005. *Cultural Landscape Report for Drakesbad Guest Ranch*, March.

Northern Sierra Air Quality Management District (NSAQMD), 2006. *Northern Sierra Air Quality Management District Annual Air Monitoring Report 2005*, April 15.

CHAPTER 2

Alternatives

2.1 Overview of the Alternatives

The National Park Service (NPS) gathered a team of staff and resource experts to develop alternatives for projects in Warner Valley. Information used included environmental surveys and studies, user data, and direct site observations undertaken by the project team. The project team developed an initial series of alternatives for different areas of concern including visitor entry sequence, road improvements, campground, trail and day use parking, employee housing, Drakesbad Guest Ranch facilities, Drakesbad Meadow and Dream Lake Dam. In this EIS, Alternative 1 is the “No Action” Alternative, and Alternative 2, is the preferred alternative and also the environmentally preferred alternative. Alternative 3 proposes many of the same changes as Alternative 2 with the primary differences being the location and configuration of certain visitor serving structures, the treatment of Dream Lake Dam, and the configuration of the campground. NPS staff participated in a Choosing by Advantages (CBA) workshop in August 2005 to evaluate preliminary alternatives. Additional study of the Dream Lake Dam alternatives were followed by a separate CBA workshop in June 2008. The following alternative descriptions are based on the results from these workshops and public comments.

Table 2-1 shows a side-by-side comparison of all three alternatives and **Figures 2-1a-c** illustrate the differences between the alternatives in a graphical representation.

2.1.1 Alternative (No Action)

Alternative 1 proposes that no substantive changes will be made to the Warner Valley area. A map of the existing conditions is shown in **Figure 2-1a**. Below is a description of the key features of Warner Valley and the existing conditions of each area. Sites are described from east to west in Warner Valley, following the visitor’s entry experience.

Entry to Warner Valley

Fee Station

Key areas of concern at the visitor’s entry are the placement of the fee station and the location of the road to the water tank that supplies the ranger station. The fee station and receptacle for fees (i.e. iron ranger) sits just before the ranger station on the north side of the road. One of the safety issues regarding this location is the lack of adequate room for parking. Visitors currently have to stop their cars in the road, or park at the ranger station and walk back 100 feet to access the fee station. In addition, the fee station is located on a blind curve, so any cars stopped in the road cannot

**TABLE 2-1
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
<p>Alternative 1 proposes that the existing conditions and needs described below would not change under this alternative</p>	<p>Alternative 2 proposes a preferred alternative for each site, selected during the Choosing by Advantages workshops conducted by NPS staff in August of 2005 and June 2008</p>	<p>Alternative 3 proposes improvements similar to Alternative 2 with modifications in each area</p>
ENTRY TO WARNER VALLEY		
<p><u>Fee Station</u></p> <ul style="list-style-type: none"> Visitor safety issues with current location of the fee station Existing pull-out is too small, located near a natural drainage, and is adjacent to a dangerous curve 	<ul style="list-style-type: none"> Move fee station to west of ranger station, at existing pull-out Fill area to raise grade Provide three parking spaces defined with rock borders Remove three trees at edge of road to improve visibility 	<p>Move fee station to new location in front of vault toilet adjacent to ranger station</p>
<p><u>Access Road to Water Tank at Ranger Station</u></p> <ul style="list-style-type: none"> Unimproved road blocks drainage ditch creating erosion Park visitors mistake the road as an access road to the Park 	<ul style="list-style-type: none"> Remove the existing road from the drainage and discontinue use Construct new service road to the water tank on the ridge to the east of the existing road with dimensions of 8 feet by 130 feet with 1 to 2 foot cuts as needed for a rock road base Restore existing roadbed by reseeded with native plants Remove two small diameter white fir trees and standing dead snags 	<ul style="list-style-type: none"> Maintain existing road to the water tank Install a culvert in the drainage ditch to decrease erosion Install a chain gate to limit access to the water tank and to eliminate confusion over the purpose of this road Stabilize entrance to the road with an apron of concrete or grass-crete cells to minimize erosion
WARNER VALLEY ROAD AND GENERAL ROAD MAINTENANCE		
<p><u>Warner Valley Road</u></p> <p>Warner Valley Road is designed for two-way traffic and is approximately 20 feet wide. Issues of concern with this road include:</p> <ul style="list-style-type: none"> Compacted gravel construction Blind, steep curve one-half mile west of ranger station Vehicles speed on downhill approach Acceleration on steep uphill causes road degradation Road dust Lack of stability Slope drainage to creek is blocked Inadequate drainage structures 	<ul style="list-style-type: none"> Replace undersized or failing culverts and follow actions outlined in the Warner Valley Road culvert inventory, which recommends adding (6) new culverts, replacing (16) existing culverts and repairing (9) culverts No action at the curve one-half mile west of ranger station Application of environmentally-approved dust suppressants in high use visitor areas (e.g. campground/day use parking zone, along some road sections, in front of the ranger station, and near Drakesbad Guest Ranch lodge/dining hall) Maintain two-way traffic on the existing road Install uniform aggregate to reduce road dust and improve stability Install rock headwalls 	<ul style="list-style-type: none"> Replace undersized or failing culverts and follow actions outlined in the Warner Valley Road culvert inventory, which recommends adding (6) new culverts, replacing (16) existing culverts and repairing (9) culverts Widen existing curve on uphill side Maintain two-way traffic on the existing road Add drainage ditch on uphill side to decrease erosion Install uniform aggregate to reduce road dust and improve stability Install rock headwalls

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
CAMPGROUND, TRAIL, AND DAY USE PARKING		
<p><u>Day Use Parking</u></p> <ul style="list-style-type: none"> Day use parking lot accommodates 12 cars, vault toilet, water and picnic tables for day hikers The existing day use parking lot is located in a wetland and too small to accommodate parking needed for day users <p><u>Hiking Trails</u></p> <ul style="list-style-type: none"> The Pacific Crest Trail connection to the Warner Valley trail system is along Warner Valley Road towards Drakesbad Guest Ranch, which creates a hazardous situation for hikers The trails are not well-connected to Warner Valley trail network Trail connections for major destinations to south begin at day use parking <p><u>Campgrounds</u></p> <ul style="list-style-type: none"> Upper and lower campgrounds are divided by the Warner Valley Road Lower campground has safety issues due to proximity to road and steep slope to the creek Traffic on Warner Valley Road creates dust that wafts into campgrounds No accommodation for camp host No accessible (ADA-compliant) camping. 	<p><u>Day Use Parking</u></p> <ul style="list-style-type: none"> Eliminate existing day use parking, toilet and picnic tables and restore area to a natural meadow / wetland Create new day use parking area in lower campground consisting of 20 gravel parking spaces Retain three picnic tables, water faucet and double vault toilet at the lower campground Remove three trees No earthwork required at new parking area <p><u>Hiking Trails</u></p> <ul style="list-style-type: none"> Provide uninterrupted Pacific Crest Trail connection with a new trail downslope from Warner Valley Road paralleling Hot Springs Creek, between new day use parking / old lower campground and old day use parking / trailhead at the meadow Install new trail by clearing brush; no tree removal Construct boardwalks over wetland areas <p><u>Campgrounds</u></p> <ul style="list-style-type: none"> Close lower campground and convert to day use parking Relocate five campsites from lower campground to upper campground and designate one as an ADA-accessible site Add new double vault toilet across from campsite #17 Expand loop road and close center loop Designate campsite #19 at entrance for camp host. Provide septic holding tank for camp host Designate parking areas with buried boulders or logs and restore areas impacted by informal parking 	<p><u>Day Use Parking</u></p> <ul style="list-style-type: none"> Eliminate existing day use parking, toilet and picnic tables and restore area to a natural meadow / wetland Create new day use parking area in lower campground consisting of 20 gravel parking spaces Retain three picnic tables, water faucet and double vault toilet at the lower campground Remove three trees No earthwork required at new parking area <p><u>Hiking Trails</u></p> <ul style="list-style-type: none"> Provide uninterrupted Pacific Crest Trail connection via new trail downslope from Warner Valley Road (paralleling Hot Springs Creek, between new day use parking / old lower campground and old day use parking / trailhead at the meadow Install new trail by clearing brush; no tree removal Construct boardwalks over wetland areas <p><u>Campgrounds</u></p> <ul style="list-style-type: none"> Close lower campground and convert to day use parking No relocation of lower campsites to upper campground. Add new double vault toilet across from campsite #17 Expand loop road and close center loop Designate campsite #19 at entrance for camp host Provide septic holding tank for camp host Designate parking areas with buried boulders or logs and restore areas impacted by informal parking

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
DRAKESBAD GUEST RANCH		
Concessioner Housing and Service Center		
<p>Fifteen concessioner staff are currently housed in temporary trailers, a dormitory above the dining hall, and in the bunk house, all within the historic district</p>	<p>Construct new service center outside the historic district and relocate concessioner staff housing:</p> <ul style="list-style-type: none"> • Eight double occupancy tent cabins to accommodate 16 people • Bathhouse with apartment unit for cook • Four single-occupancy bathrooms with showers (one ADA-compliant facility), and kitchen unit • Install hybrid power system • Create short loop road for vehicle access • Remove three trees during construction • Create 13 employee parking spaces 	<p>Construct new service center outside the historic district and relocate staff housing here consisting of:</p> <ul style="list-style-type: none"> • Two-story wood frame dormitory with apartment unit for cook to accommodate 17 people • Four single-occupancy bathrooms with showers, and kitchen unit • Install hybrid power system • Create short loop road for vehicle access • Remove three trees during construction • Create 13 employee parking spaces
Small Scale Features		
<p>The following features are currently located in the historic district at Drakesbad Guest Ranch:</p> <ul style="list-style-type: none"> • Dumpster • Generator • Propane tanks • Site Storage at 'Boneyard' 	<ul style="list-style-type: none"> • Relocate dumpster to new service center • Relocate generator and enclose in a building at the service center • Relocate and screen propane tanks and site storage at the new service center • Construct new storage and delivery building in the service center • Restore areas where existing small scale features are located 	<ul style="list-style-type: none"> • Relocate dumpster to new service center • Relocate generator and enclose in a building at the service center • Relocate and screen propane tanks and site storage at the new service center • Construct new storage and delivery building in the service center • Restore areas where existing small scale features are located
Bathhouse and Pool		
<p>Existing bathhouse contains:</p> <ul style="list-style-type: none"> • Women's restroom (two toilets, one sink) • Men's restroom (one toilet, one urinal, one sink) • Two private bathtubs • Four private showers • Four changing stalls • No ADA-accessible restrooms • Massage room • Storage/mechanical room 	<p>Bathhouse renovation design would incorporate:</p> <ul style="list-style-type: none"> • ADA-accessible women's restroom (two toilets, one sink) • ADA-accessible men's restroom (one toilet, one urinal, one sink) • One accessible shower • One bathtub/shower • Six standard showers • One message room • Remove four changing stalls 	<p>Bathhouse renovation design would be the same size as Alternative 2, but with a different layout</p> <p>Existing mechanical room, women's restroom and men's restroom would remain</p> <p>Existing bathhouse would be extended to include:</p> <ul style="list-style-type: none"> • One ADA-accessible single-occupancy restroom with shower • One bathtub • Seven showers • Four changing stalls

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
DRAKESBAD GUEST RANCH (cont.)		
Bathroom and Pool (cont.)		
<ul style="list-style-type: none"> Filter house (noncontributing structure in the historic district) is located on the pool deck Concrete coping and deck at pool are not in keeping with historic character 	<ul style="list-style-type: none"> Storage closet <p>Additional modifications:</p> <ul style="list-style-type: none"> Relocate filter house to a filter/pump room in the bathroom Install photovoltaics to south side of roof Replace coping and deck with historically compatible material such as stone paving Stabilize eroding stream banks with native riparian plant species 	<ul style="list-style-type: none"> Two massage rooms Storage closet <p>Additional modifications:</p> <ul style="list-style-type: none"> Relocate filter house to a filter/pump room in the bathroom Install photovoltaics to south side of roof Replace coping and deck with historically compatible material such as stone paving Stabilize eroding stream banks with native riparian plant species
Circulation at Drakesbad Guest Ranch		
<u>Parking</u>		
<ul style="list-style-type: none"> Guests and staff currently park vehicles wherever they can find space Approximately 70 parking stalls exist Parking areas tend to “creep,” slowly expanding over time 	<ul style="list-style-type: none"> Relocate parking to designated areas Designate parking with rock barriers Limit overnight guest parking to two cars per unit Designate short-term and long-term parking Close loop road at the Mission 66 duplexes Restore impacted areas 	<ul style="list-style-type: none"> Relocate parking to designated areas Designate parking with rock barriers Limit overnight guest parking to two cars per unit Designate short-term and long-term parking Close loop road at the Mission 66 duplexes Restore impacted areas
<u>Access Road to Water Tank</u>		
<ul style="list-style-type: none"> Compacted gravel road is approximately 12 feet wide by 300 feet long Existing road interrupts flow of spring water to fen Culverts have been installed to improve water flow Water tank requires regular maintenance and testing 	<ul style="list-style-type: none"> Rebuild road with permeable roadbed and narrower width than existing condition Maintain existing culverts for flows from springs upslope 	<p>Add additional culverts under the existing road</p>

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
DRAKESBAD GUEST RANCH (cont.)		
Pedestrian Circulation at Drakesbad Guest Ranch		
<p><u>Walkways within Drakesbad Guest Ranch</u></p> <ul style="list-style-type: none"> There is no definition of walkways There are many pathways and they are deteriorating natural resources Historic paths have been lost and many are not in character with cultural landscape 	<p>No action proposed</p>	<p>Minimize number of paths and define trails with low stones in keeping with historic trails</p>
<p><u>Access Road/Path to Pool and Bathhouse</u></p> <ul style="list-style-type: none"> Impermeable gravel road, 12 feet wide by 100 feet long, designed to accommodate service vehicles Road prevents natural sheet flow of water to meadow 	<ul style="list-style-type: none"> Replace existing road/path to pool and bathhouse with a narrower profile pathway approximately 7 feet Replace base of path with permeable base rock Replace surface of path with grass cell pavers with native grasses 	<p>Replace existing road/path to pool and bathhouse with a boardwalk constructed for an electric golf cart or small service vehicle</p>
<p><u>Trail from Corral across meadow/fen to trail network</u></p> <ul style="list-style-type: none"> Existing trail is a compacted gravel road, 8 feet by 140 feet Trail creates obstruction to water flow on south side of the meadow 	<ul style="list-style-type: none"> Construct 8-foot wide boardwalk in same location to allow natural drainage Restore impacted area by reseeding with native plants Remove causeway material (22 cubic yards of soil) from the meadow 	<p>Install additional culverts in increase water flow to meadow</p>
Land Use		
<p><u>Corral</u></p> <p>The corral serves a historic use, and is used by visitors at Drakesbad Guest Ranch. Corral features include:</p> <ul style="list-style-type: none"> Space for 20-24 horses Tack shed Parking area for feed and storage 	<ul style="list-style-type: none"> Expand upper corral into existing 'boneyard' with a footprint of 24 feet by 40 feet and historically-compatible design Maintain tack shed in existing location Maintain lower corral as a part of cultural landscape, but no longer use Add bio-filtration system to southern edge of corral to mitigate effluent Enclose seed-free feed in a new storage structure at existing propane tank area 	<ul style="list-style-type: none"> Construct new 60 feet by 100 feet corral, tack shed and feed storage at a site north of Warner Valley Road, outside the historic district Construction may require grading New seed-free feed storage building would be the same design as in Alternative 2 Existing corral would be used for staging of rides, but horses would not be housed there Add biofiltration system to existing corral to mitigate effluent

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
DRAKESBAD GUEST RANCH (cont.)		
Land Use (cont.)		
<p><u>Volleyball Court</u> Existing 500 square foot sand court is located in historic district and impacts the viewshed</p>	<p>Remove sand court and restore disturbed area with native plants</p>	<p>Remove sand court and restore disturbed area with native plants</p>
<p><u>Dining Hall Service Area</u></p> <ul style="list-style-type: none"> • Service area at the rear of the dining hall is used for deliveries, staging, and other work functions • Service area also serves as an outdoor employee break area • There is a seasonal wetland between generator and dining hall 	<ul style="list-style-type: none"> • Re-grade dining hall service area to direct surface flow away from building, directing flows to adjacent wetland • Provide a picnic table on a small patio as an employee break area • Bury electrical lines 	<ul style="list-style-type: none"> • Re-grade dining hall service area to direct surface flow away from building, directing flows to adjacent wetland • Bury electrical lines
<p><u>Outdoor Dining Area</u> Gravel surface is not visually compatible with park setting and the surface is not ADA-compliant</p>	<ul style="list-style-type: none"> • Resurface patio with material that is more compatible with the site and ADA-compliant 	<ul style="list-style-type: none"> • Remove outdoor dining area
<p><u>Walls at Cabins # 9,10,11,12</u> Concrete block retaining walls at cabin entry for sitting area.</p>	<p>Replace concrete block walls with stone walls</p>	<p>Cover existing exterior porch concrete block walls with stone veneer</p>
DRAKESBAD MEADOW		
<p>The meadow is a natural and cultural resource that has degraded over time due to:</p> <ul style="list-style-type: none"> • reduction in water flows • introduction of non-native vegetation species • proliferation of pocket gophers and gopher tunnels <p>Recent improvements include the installation of culverts under the road to the water tank and the damming of existing drainage ditches to create sheet flow across the meadow</p>	<ul style="list-style-type: none"> • Fill man-made features with fill • Analyze all structures that divert groundwater or surface water flowpaths including roads, ditches and impoundments • Restore drainage ditches • Re-establish historic flowpaths by removing the road, and re-grading and re-vegetating the hillside • Re-flooding trails may require additional boardwalk construction • Use seed-free feed for stock and enclose storage for hay and feed • Use biofiltration system for horse manure • Manage vegetation to maintain historic views 	<ul style="list-style-type: none"> • Install metal sheets at key points in drainage ditches • Install culverts under roads and trails to improve sheet flow • Use seed-free feed for stock and enclose storage for hay and feed • Use biofiltration system for horse manure • Manage vegetation to maintain historic views

**TABLE 2-1 (Continued)
COMPARISON OF ALTERNATIVES**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
DREAM LAKE DAM		
<p>Dream Lake Dam, constructed in 1932, impounds 2.7 surface acres of water</p> <ul style="list-style-type: none"> The dam is a contributing feature to historic district and is used by Drakesbad Guest Ranch guests for fishing, bird watching and canoeing Structural deficiencies include sloughing, sinkholes, settlement, seepage, and detrimental vegetation are affecting dam structure 	<ul style="list-style-type: none"> Remove existing dam Dam removal and restoration would require heavy equipment at site Remove approximately 32 trees Restore area with a channel network stabilized by log and rock step pools, a functioning floodplain and associated flood plain wetlands 	<ul style="list-style-type: none"> Reconstruct existing dam to meet Bureau of Reclamation standards Dam reconstruction would require heavy equipment at site Remove approximately 32 trees New dam would be higher than existing dam and would include a 20-foot wide spillway Diversion outlet would include a trash rack, stilling basin, sand filter, bullhead gate, valve box and energy dissipater Soil material for dam embankment and rock materials for dam face would be imported to the Park





NOTE: Yellow lettering represents a change from the existing conditions.



SOURCE: GlobeXplorer, ESA

Warner Valley Comprehensive Site Plan
Figure 2-1b
 Warner Valley Alternative 2



NOTE: Yellow lettering represents a change from the existing conditions.



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be seen until the last moment by traffic coming into Warner Valley. Pedestrian circulation around the fee station additionally puts pedestrians in the roadway along with vehicular traffic. Another issue is that the fee station is located in a natural drainage with soft soils, so that the braking and accelerating of cars causes excessive wear on the road. The current location of the fee station is difficult to monitor by park staff, which is a concern due to the ongoing problem of fee theft.

Access Road to Water Tank at Ranger Station¹

A different area of concern at the entry is an unimproved road to the water tank that supplies the seasonal ranger station. The road diverts a natural drainage, creating erosion. The road also creates confusion to visitors who mistake it for an access road. Access to the tank needs to remain in some form, as the tank is monitored regularly for water quality.

Warner Valley Road

Designed for two-way traffic, the Warner Valley Road is approximately twenty feet wide and of compacted gravel construction. General issues on the entry road include road dust, lack of stability, blocking of drainage from the slopes into the creek, and inadequate drainage structures.

One specific area of concern on the road is located approximately one-half mile west of the ranger station. The road dips and then turns into a blind curve on a slope with a steep incline. Acceleration causes rutting in certain locations, though to date, no accidents have been recorded on this section of road.



Blind Curve along Warner Valley Road

Campground, Trail, and Day Use Parking

The campground and day use parking are related to one another, and therefore are viewed as one planning unit.

The existing campground has two sections divided by the Warner Valley Road see **Figure 2-2**. The campground below the road has safety, natural resource, and visitor experience issues. The main safety issues are the close proximity of the campsites to the creek and the road.



Upper Campground

¹ Note that there are references to two different water tank access roads throughout this document, one that serves the ranger station, and one that serves Drakesbad Guest Ranch

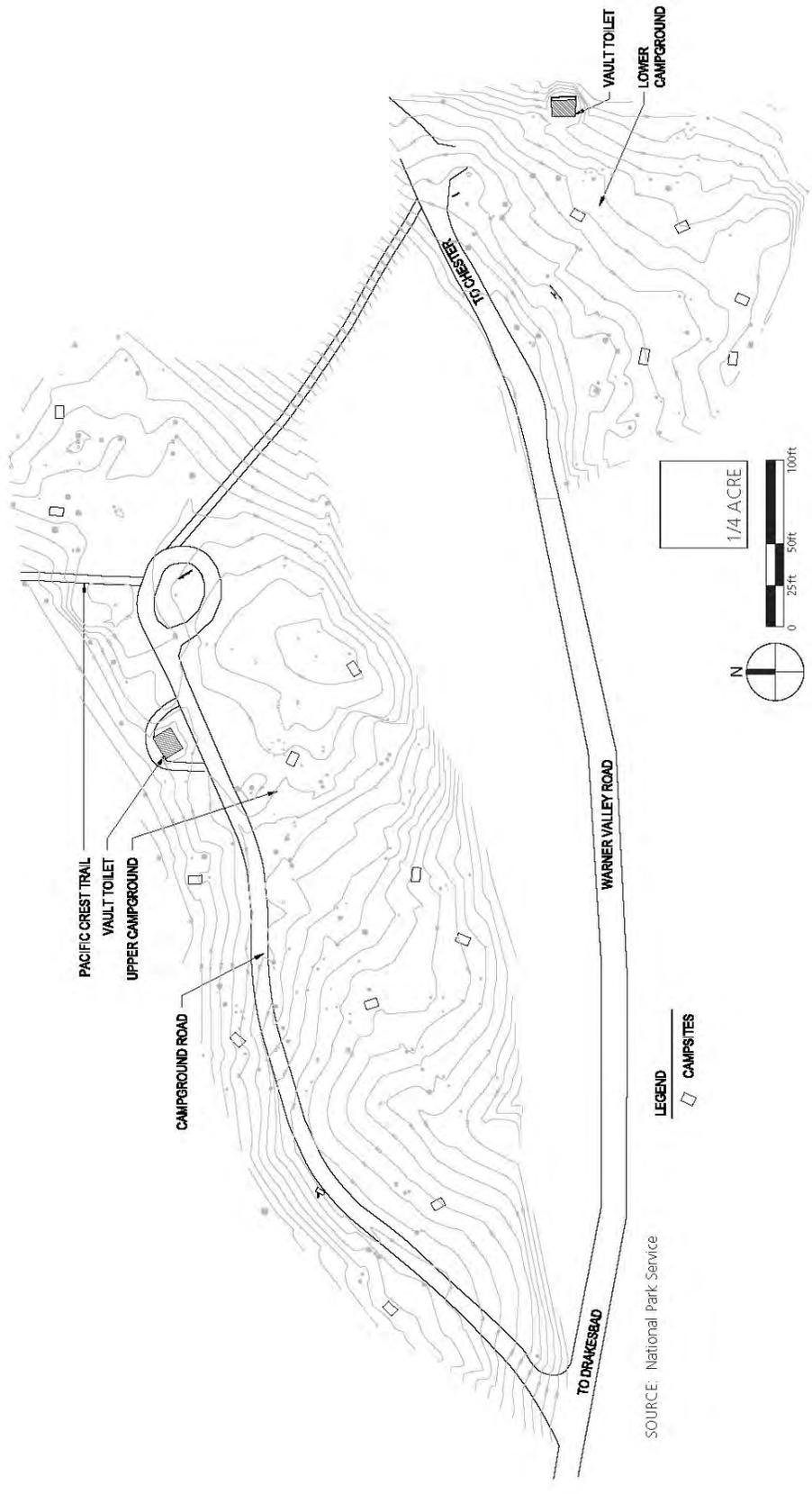


Figure 2-2
Campground and Pacific Crest Trail – No Action

There is a steep slope from the campsites down to the creek that is hazardous for visitors. The proximity of the campsites to the creek creates an adverse impact on the creek due to erosion produced by the campers. Traffic on Warner Valley Road creates dust that wafts into the lower campground.

The upper campground is located on the north side, above the Warner Valley Road, and is the larger of the two existing campgrounds. The campground is large enough to accommodate additional campsites. Delineation of parking areas is poor, resulting in degradation of the vegetation. Dust from Warner Valley Road is also an issue here, but less so than for the lower campground.

The Pacific Crest Trail exits on the north side of the upper campground. The campground and Pacific Crest Trail have poor connections to the rest of the Warner Valley trail system. The existing connection is along Warner Valley Road towards Drakesbad Guest Ranch, which creates a hazardous situation for the hikers and diminishes the visitor experience.

The existing day use parking is a gravel lot accommodating approximately twelve cars. The area also has a vault toilet, potable water and picnic tables for day hikers. The existing day use parking is located in a wetland area and is too small to accommodate parking for the day users and overflow parking from Drakesbad Guest Ranch. Trail connections for the major destinations to the south begin at the day use parking (**Figure 2-3**).



Day Use Parking

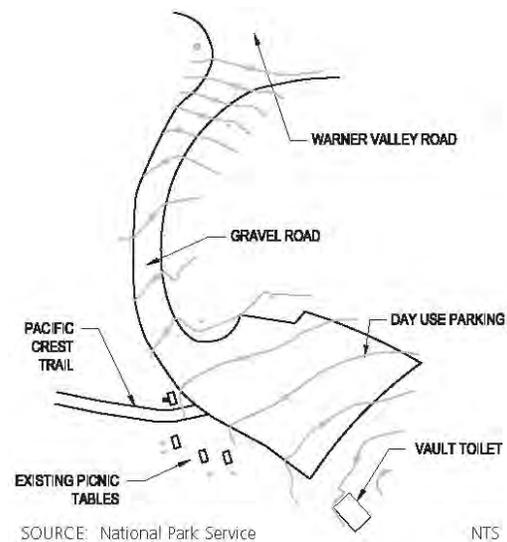


Figure 2-3
Day Use Parking – No Action

Drakesbad Guest Ranch

Drakesbad Guest Ranch Historic District encompasses the entire 440 acres owned by the Sifford family during the period of significance. The focus of most guest services centers on the primary building cluster around Drakesbad Lodge. Drakesbad Meadow is adjacent to this primary cluster and is part of two contributing views. Contributing resources farther afield include Dream Lake Dam, Boiling Springs Lake, and three trails. Ten of the buildings at Drakesbad Guest Ranch remain from the historic period and are listed in the National Register of Historic Places as contributing resources, including the lodge, dining hall, food locker, bunkhouse, and six cabins. Individual guest cabins are located east and west of the core building complex (**Figure 2-4**).

All of the historic buildings are vernacular in style, wood-frame with gable metal roofs. The building cluster also contains more contemporary buildings including: three Mission 66 duplexes, a tack room, a concession office, and a generator building. With the exception of the concrete generator building, the modern buildings are all wood-frame and are compatible with the architectural character of the historic buildings in terms of material, scale and massing (NPS, 2005). Areas that are being reviewed and considered for change include concessioner housing, service facilities, the bathhouse and pool area, and circulation, as well as several small site features.

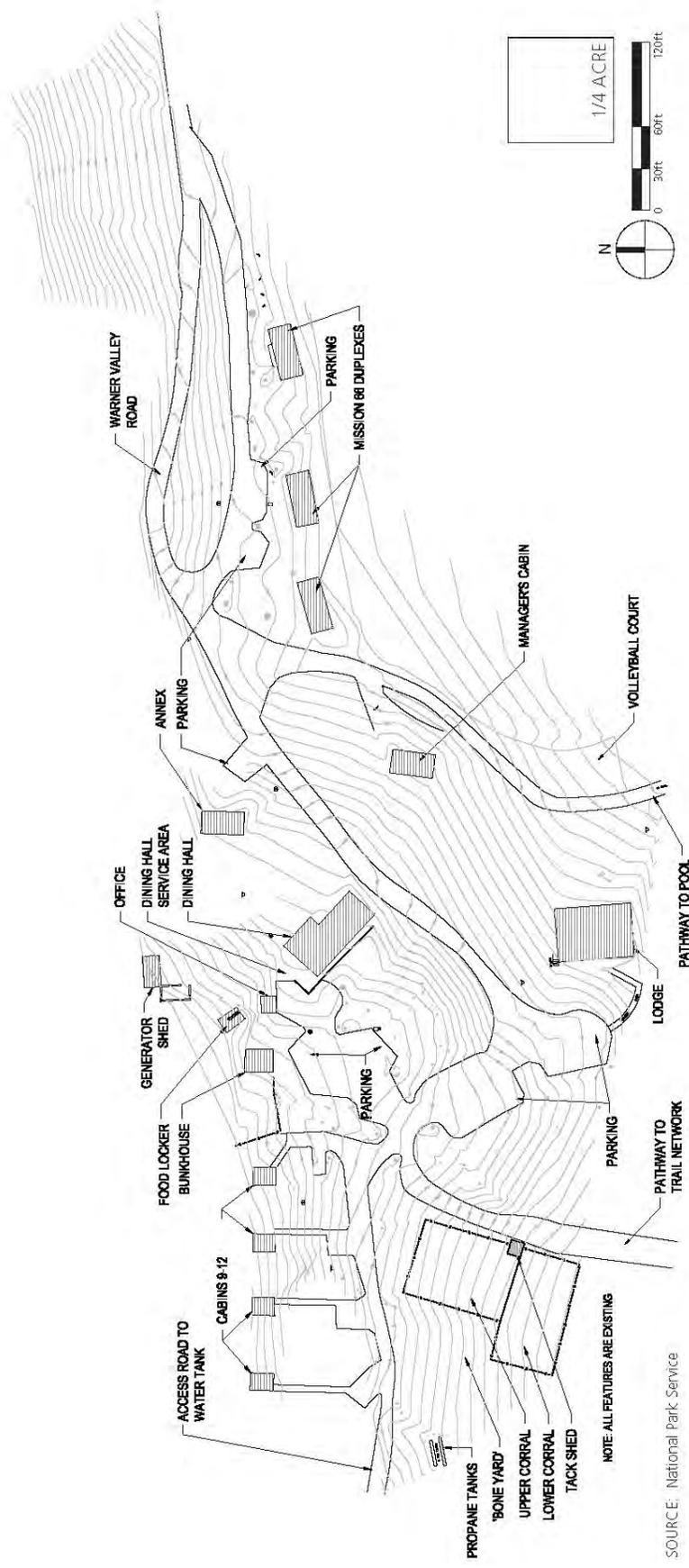
Concessioner Housing and Service Center

Service facilities and housing in Warner Valley have been added in an ad-hoc fashion to the historic core of Drakesbad Guest Ranch over the years. These uses include staff housing (now partly accommodated in temporary travel trailers), storage of building materials and other supplies (the ‘bone yard’), propane tanks, generator and parking for staff.

The current concessioner housing is not large enough to house the staff members and is of substandard construction. Concessioner staff housing within the Drakesbad Guest Ranch structures includes a dormitory above the dining hall (holds eight employees) and a small dormitory above the laundry, called the bunkhouse (holds three employees). These do not provide adequate capacity, therefore three travel trailers are used to accommodate four more staff members. One trailer is 16-feet long, one is 20-feet long and one is 28-feet long. They are located in a space between the bunkhouse and the nearest cabin. There are no utility hook-ups for the trailers and the arrangement does not provide adequate privacy or social space for the employees. The trailers are difficult to screen visually and they are not compatible with the cultural landscape. The most recent concession contract stipulates that use of travel trailers will no longer be allowed in Drakesbad Guest Ranch (NPS, 2009).



Trailers and Laundry / Concessioner Housing Building



Warner Valley Comprehensive Site Plan

Figure 2-4
Drakesbad Guest Ranch - No Action

Small Scale Features

Over the history of Drakesbad Guest Ranch, small-scale features have been added to the site as needed. The features have not always been placed in the best location, but due to their necessity, some cannot be eliminated. These items include the dumpster, propane tanks, site storage at the ‘bone yard’, concrete block walls at cabins 9, 10, 11 and 12, generator, sewer line and overhead power lines (all utility connections).

Dumpster

The dumpster is currently located at the entrance to the historic district and is visible from the road.

Propane Tanks

The propane tanks are located on the west side of the corral just below the water tank access road. The tanks have a visual impact on the cultural landscape and detract from the visitor experience.

Site Storage at the ‘Bone Yard’

The ‘bone yard’ is located between the existing corral and propane tanks. It serves as a storage area for various items at Drakesbad Guest Ranch such as palettes, feed for the horses, building materials and other miscellaneous items. There is no screening of the ‘bone yard’, so it has a visual impact on the cultural landscape and detracts from the visitor experience.



‘Bone Yard’

Bathhouse and Pool

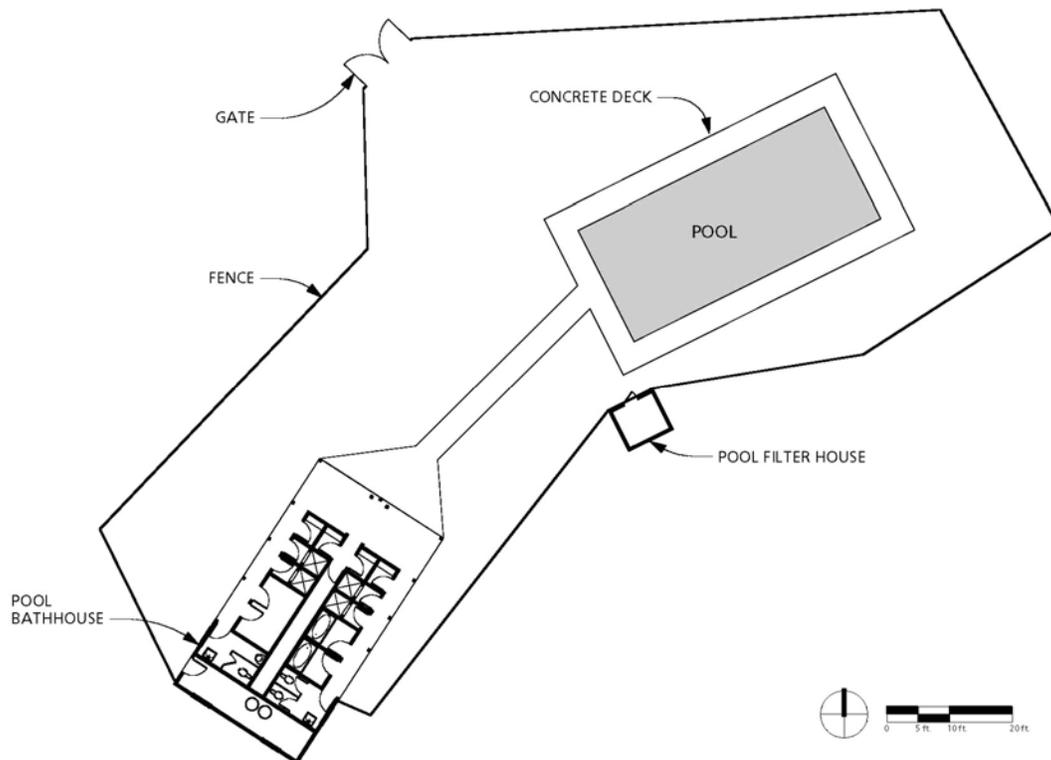
The existing bathhouse and pool provide facilities for swimming, bathing and massage. The existing bathhouse facilities are in disrepair, are not accessible to the physically disabled, and do not provide sufficient storage space or an adequate quantity of showers and massage rooms. The filter house is located next to the pool deck; it is noisy and it obstructs the view of the creek. The pool coping and decking do not match the historic character of Drakesbad Guest Ranch. The stream banks along Hot Springs Creek are unstable and eroded areas have been armored with cobble/rock-filled gabion mesh baskets.



Bathhouse

The existing bathhouse contains a women's restroom (two toilets, one sink), a men's restroom (one toilet, one urinal, one sink), two private bathtub compartments, four private shower compartments, four private changing stalls, a massage room with two doors, and a storage/mechanical room at the rear of the building. The spaces are arranged along both sides of a plumbing chase and doors open to a porch that wraps three sides of the building. The porch is 2 feet-6 inches deep at the north and south and 7 feet deep facing the pool. The building is wood frame construction clad in wood lap siding with 6-inch by 6-inch wood posts supporting the roof, and a low slope (approximately 3:12) gable roof with metal roofing. The overall dimensions of the bathhouse are 23 feet-7 inches by 43 feet-1 inch (1016 square feet). The building is not a contributing structure to the historic district (**Figure 2-5**).

The filter house contains filter and pump equipment for the pool operation. The filter house is a wood frame structure clad in wood siding. The overall dimensions are 7 feet-3 inches by 8 feet (58 square feet). The building is not a contributing structure to the historic district. As noted above, the filter house is located next to the pool deck. It is noisy and it obstructs the view of the creek, and therefore detracts from the visitor experience.



Warner Valley Comprehensive Site Plan •

Figure 2-5
Bathhouse and Pool – No Action

Circulation at Drakesbad Guest Ranch

Site circulation is rural in character with dirt/gravel roads and rocks/logs defining the circulation patterns. Over time, the edge “creep” of parking areas and roads has created large impacted areas and unclear zones for traffic. In addition, construction practices of placing compacted bases on roads and trails have obstructed natural water flow, damaging the meadow and fen environment. Some of the circulation features that need to be addressed are parking areas, walkways, trails and the access road to the water tank.

Parking

Guests and staff currently park vehicles wherever there is clear space to park, which creates a disorganized and confusing parking pattern. Though this lack of defined parking makes it difficult to accurately count parking stalls, approximately 70 exist within Drakesbad Guest Ranch. The parking areas tend to “creep,” slowly expanding over time due to a lack of edge definition. As parking creeps, natural areas are disturbed, which has an adverse impact on the natural resources and cultural landscape, detracting from the visitor’s experience.

Access Road to Water Tank

The access road to the water tank that serves Drakesbad Guest Ranch is a compacted gravel road, approximately 12 feet wide by 300 feet long. Acting as an obstruction, the existing road does not allow natural flow of spring water to the fen. To improve water flow to the fen, NPS staff has installed culverts in recent years. The water tank requires regular maintenance and testing; however, the road is wider than necessary. Culverts introduced in the last three years have restored some flow but create point discharge instead of uniform flow.

Pedestrian Circulation

Walkways and Trails within Drakesbad Guest Ranch

The walkways within Drakesbad Guest Ranch have multiplied over the years, creating more pathways than necessary. Most paths do not have defined edges and historic path alignments have been abandoned. Many of the paths have a negative impact on the natural resources.

The two major trails/paths that lead from the Drakesbad Guest Ranch across the meadow are discussed below.



Path to Bathhouse

The first, the access trail/road to the pool and bathhouse, is an impermeable gravel road that creates an obstruction to water flow in the meadow. The trail is approximately 12 feet wide by 100 feet long, designed to accommodate service vehicles.

The second major trail from the Drakesbad Guest Ranch leads from the corral to the trail network on the south side of the meadow. The trail construction is compacted gravel, approximately 8 feet wide by 140 feet long, which creates obstruction to water flow in the meadow/fen complex.

Trails

A number of hiking trails lead from Drakesbad Guest Ranch to area destinations such as Devils Kitchen, Boiling Springs Lake, Kings Creek and Summit Lake. The Pacific Crest Trail also passes through Warner Valley. Although it crosses Warner Valley Road, it does not continue directly on the other side, causing hikers to travel along the road a short distance in order to continue on the trail. Overall, the extensive network of trails provides access to many other lakes, creeks and meadows in Warner Valley, creating a variety of recreational opportunities for park users.

Another cultural landscape issue is consideration of the reopening, preservation, and maintenance of historic trails (Head of the Valley Trail, Kitchen Trail, High Trail above Devils Kitchen, South trail along Hot Springs Creek from campground to east park boundary).

Ongoing trail maintenance is critical to the Warner Valley trail network. The NPS has developed standards for regular trail maintenance to protect and restore the natural habitat and resources for the rich variety of plant and wildlife found in the park. These standards include the use of water bars to stop trail erosion, constructing boardwalks in wetland areas, as well as general trail clearing and tread upkeep.

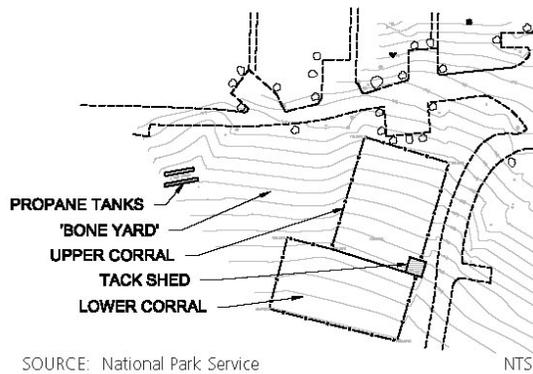


Map of the Warner Valley Trail Network

Land Use

Corral

The corral serves a historic use, and is a significant amenity for the visitors at Drakesbad Guest Ranch. The corral holds up to 24 horses and is approximately 7,500 square feet (**Figure 2-6**). In addition to the corral, there is a small tack shed and a small parking area used for feed and general storage. Some adverse environmental impacts from the corral are: the effluent flows into the meadow; seed from hay spreads non-native grasses into the meadow; wildlife feed on the hay; and the odor from the corral drifts into the Drakesbad Guest Ranch area.



Corral and Tack Shed

Figure 2-6
Corral – No Action

Volleyball Court

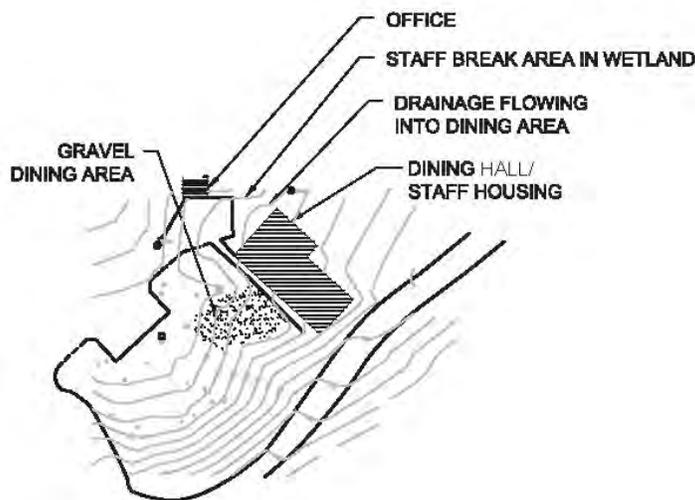
The volleyball court is a non-historic feature of Drakesbad Guest Ranch, and is not part of the cultural landscape. The sand court is approximately 500 square feet. It detracts from the experience of the cultural landscape and is located within the sensitive scenic viewshed of Mt. Harkness from the deck/porch of the Drakesbad lodge.

Dining Hall Service Area

The service area at the rear of the dining hall is used for deliveries, staging and various work functions. It also serves as an outdoor employee break area. Although the area is partially screened with seasonal fencing, it is disorganized and unsightly for visitors to Drakesbad Guest Ranch. There are also drainage problems behind the building. A seasonal wetland is located between the generator and the dining hall. Snowmelt and spring water drain toward the dining hall causing flooding problems for the dining hall. The nearby generator is noisy and overhead electrical lines are unsightly.

Outdoor Dining Area

The outdoor dining area is located adjacent to the dining hall. It consists of a gravel surface that is not visually compatible with the cultural landscape setting or the natural setting (**Figure 2-7**). The surface is not firm enough for the use and is not ADA-compliant. The dining area has four tables and is located on an area of approximately 160 square feet.



SOURCE: National Park Service

Warner Valley Comprehensive Site Plan

Figure 2-7
Dining Area – No Action

Walls at Cabins #9, 10, 11, 12

The cabins located at the northwest edge of Drakesbad Guest Ranch directly north of the corral have concrete block retaining walls that were added to provide a sitting area for each cabin. The concrete block does not fit the historic character of Drakesbad Guest Ranch (see Figure 2-3).

Drakesbad Meadow

Drakesbad Meadow is a major natural and cultural resource for Warner Valley that has degraded over time due to reduction in water flows and introduction of non-native vegetation species. The reduction of water flows has led to both the proliferation of pocket gopher tunnels, and the reduction of native species that require water flow. Non-native vegetation species have been introduced into the meadow ecology primarily from the spreading of seeds found in the feed for the horses at the corral. However, there has been some improvement to water flow, species diversification and overall fen ecology as a result of the actions taken as part of the study by researchers from Colorado State University. These actions include installing culverts under the road to the water tank and damming of some of the existing drainage ditches to create sheet flow across the fen.

Dream Lake Dam

Dream Lake Dam, located across Hot Springs Creek southwest of the Drakesbad Guest Ranch building core, impounds approximately 2.7 surface acres of water that is up to 5-feet deep, known as Dream Lake (**Figure 2-8**). The dam was originally constructed in 1932 and was reconstructed after failures in 1938 and 1952. Dream Lake Dam is a contributing resource (structure) of the historic district because it was constructed within the period of significance of the historic Drakesbad Guest Ranch (Sifford, 1994). Drakesbad Guest Ranch guests use the lake for fishing, bird watching and canoeing.



Warner Valley Comprehensive Site Plan •

Figure 2-8
Dream Lake – No Action

The dam is an earthen structure and was constructed from soils extracted from nearby borrow pits, to the southwest of the lake. Soils were not properly compacted when the dam was constructed, and are characterized by excessive moisture content.

Four spring-fed tributary streams feed into Dream Lake. The water level is regulated by a spillway and associated bypass channels on the north side of the lake, however there is no operational low-level outlet pipe. Beavers have constructed dams at the spillway, impeding spillway flow and causing overtopping at low points in the crest of the dam.

The overall lack of maintenance at the dam and the impact of beaver activity has left the dam in a weakened state with a risk of failure (NPS, 2008). A Condition Survey Report completed in November 2000 to evaluate the downstream hazard classification of Dream Lake Dam reported that, although the dam had numerous deficiencies, the dam was a low-hazard potential structure due to its small size. No loss of life is expected to occur downstream if the dam were to fail (Graham, 2000).

2.1.2 Alternative 2 (Preferred)

Alternative 2 is the preferred alternative and was recommended during the Choosing by Advantages workshops conducted by NPS staff in August of 2005 and June 2008.

Entry to Warner Valley

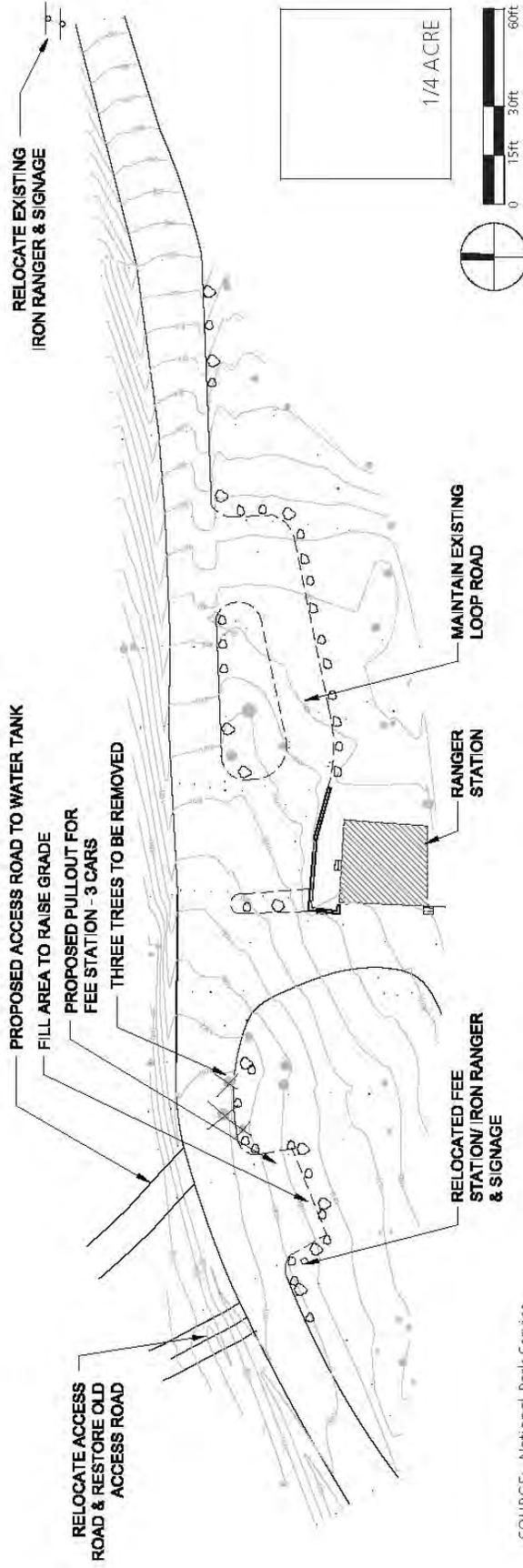
The preferred alternative for the entry has two major components; relocating the fee station and creating a new access road to the water tank. Details of the proposed changes are as follows.

Fee Station

The fee station would be moved to a new location west of the ranger station at an existing pull out on the south side of the road to increase visibility for monitoring and protecting the fee station and the money kept within. The existing roadbed would be restored by outsloping the existing road bed back to the original contours and reseeding it with native plants (**Figure 2-9**).

Existing grade would rise approximately 2 feet in the lower corner of the pull out in order to level the area, by importing approximately 12 cubic yards of fill from construction of the new road to the water tank (discussed below).

Also part of this proposed alternative would be the removal of three trees with 24-42-inch diameter for improved visibility along road. Parking would be defined with buried rocks or logs as shown in Figure 2-9.



Warner Valley Comprehensive Site Plan

Figure 2-9
Entry to Warner Valley –
Alternative 2 (Preferred)

Access Road to Water Tank at Ranger Station

The second proposed improvement to the area is construction of a new service road to the water tank and removal of the existing road from the drainage, which currently diverts flow and causes erosion. The new road would be built on the ridge to the east of the existing road, and the existing roadbed would be restored by reseeding with native plants. The new road would be a minimum width of 8 feet and 130 feet in length with 1 to 2 foot cuts as needed for a rock road base. Cut material would be used as the fill needed for the fee station pullout discussed above. The new road alignment would require removal of two small diameter white fir trees and standing dead snags.

Warner Valley Road Improvements and General Road Maintenance

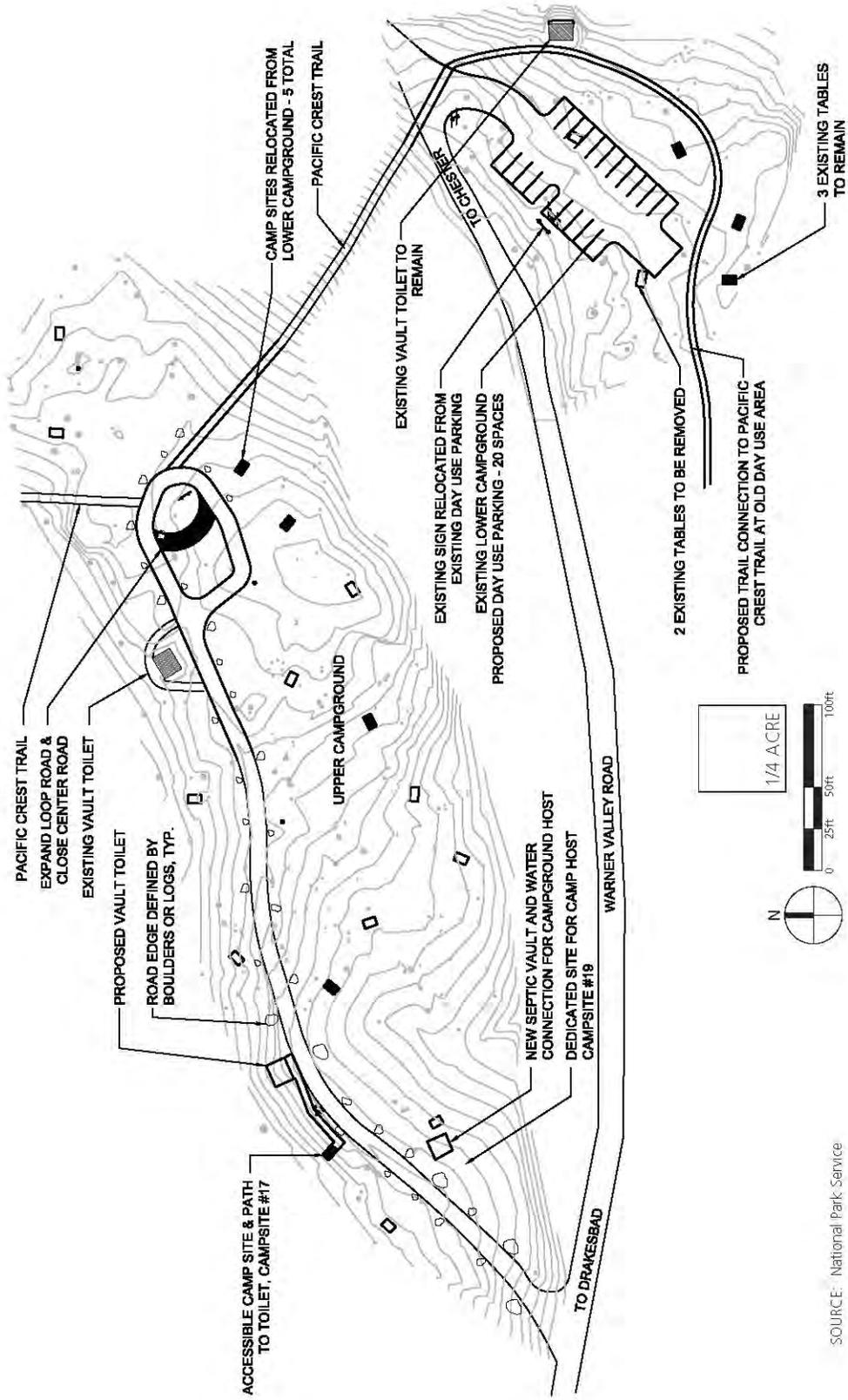
Warner Valley Road improvements in the preferred alternative would increase drainage and reduce dust. This alternative would follow actions outlined in the Warner Valley Road culvert inventory (see Appendix A), which recommends adding (6) new culverts, replacing (16) existing culverts and repairing (9) culverts. Improvements would also include the application of environmentally-approved dust suppressants in high use visitor areas, such as the campground/day use parking zone, along road sections where visibility is an issue, in front of the ranger station, and near Drakesbad Guest Ranch lodge/dining hall.

Other improvements proposed under this alternative would include replacing undersized and/or failing culverts along the entire length of Warner Valley Road, installing rock headwalls and installing uniform aggregate to reduce road dust and improve stability.

Campground, Trail, and Day Use Parking

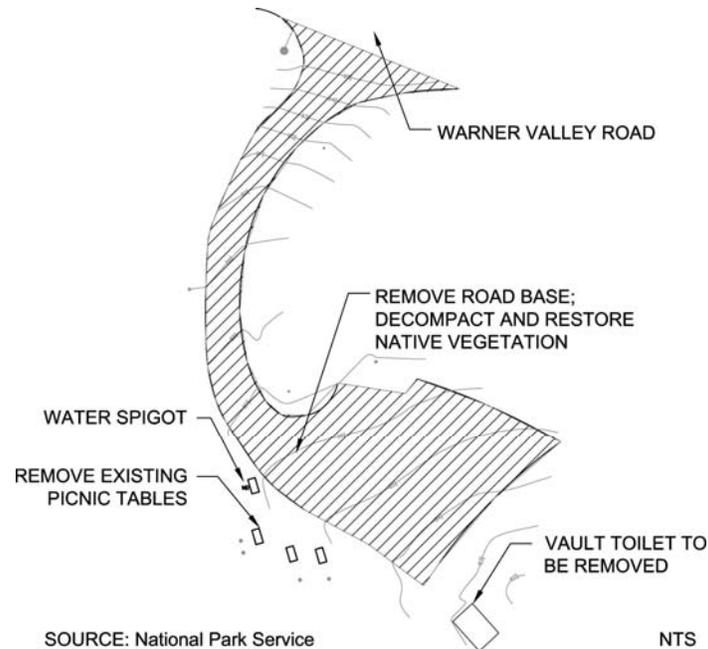
The preferred alternative would close the lower campground, relocate the five existing campsites to the upper campground, and relocate the day use parking and trailhead to this location (**Figure 2-10**). The day use area would be completely restored by removing the single vault toilet, three picnic tables, and trailhead signs (signs to be relocated to new trailhead location). The rock road base at the existing day use parking and access road would also be removed and the area decompacted using scarification techniques to a depth of 6-12 inches. The area would then be restored to a natural meadow/ wetland by reseeding and planting with propagated native plants. The existing water spigot and supply pipe would be removed and capped (**Figure 2-11**).

In the upper campground, the preferred alternative would add five sites including an accessible site to replace the campsites removed from the lower campground. Proposed elements for the accessible campsite would include accessible surfacing around the tent site as well as to the bathroom, and the installation of a table, grill and faucet designed for uniform accessibility. This plan would also include the installation of a new double-vault toilet across from campsite #17. Campsite #19 would be designated for the campground host, and would include a water connection and septic holding tank for this site. This alternative also recommends designating parking areas with buried boulders or logs and restoring the impacted areas where informal non-defined parking has destroyed nearby vegetation.



Warner Valley Comprehensive Site Plan

Figure 2-10
Campground, Trail, and Day Use Parking –
Alternative 2 (Preferred)



Warner Valley Comprehensive Site Plan ■

Figure 2-11
Restored Day Use Parking Area –
Alternative 2 (Preferred)

In the lower campground, the preferred alternative proposes a new day use parking area that would consist of 20 gravel parking spaces defined with rock borders. It would retain three picnic tables, a water faucet and the existing double vault toilet for day use. No earthen work is required at the new parking area, but three trees with diameters between 1-2 feet would be removed.

Details of the proposed changes to the Pacific Crest Trail are as follows:

- Provide uninterrupted Pacific Crest Trail connections by constructing a new trail down slope from the Warner Valley Road paralleling Hot Springs Creek between the new day use parking at the old lower campground and the old day use parking/ trail head at the meadow.
- Install the new trail by clearing brush with no tree removal. Construct boardwalks, similar to the boardwalk shown here, over



Boardwalk in Drakesbad Meadow

any wetland areas. On the north side of Warner Valley, the trail would follow the abandoned service road through the upper campground to connect to the new day use/trailhead.

Drakesbad Guest Ranch

Concessioner Housing and Service Center

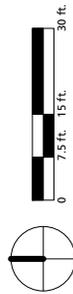
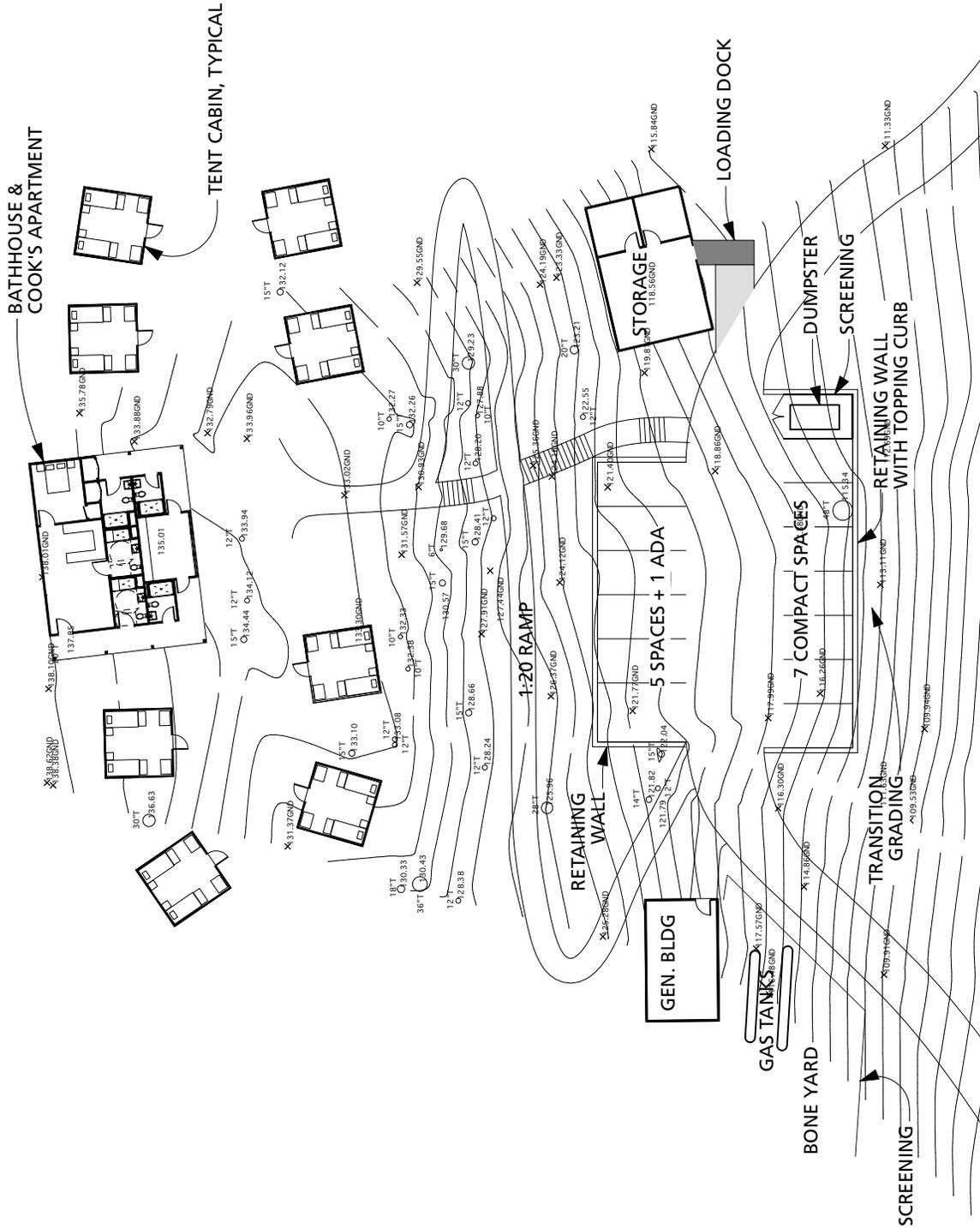
The preferred alternative proposes a new service center outside the historic district with staff housing provided in tent cabins. The service center would include concessioner employee housing, gravel road, 13 employee parking stalls, enclosed storage to replace the bone yard, the relocated generator and the relocated propane tanks (**Figure 2-12**). It would also include relocated cold food storage and dry goods storage, as well as the relocated dumpsters.

This proposed site is east of the historic district and would occupy a relatively flat area several hundred feet north of the Warner Valley Road. New construction would be partially hidden from the road. A short loop road would provide vehicle access to this area. Impacts to wetland areas that border both sides of the building site would be avoided. Construction would require removal of one 12-inch diameter, one 20-inch diameter and one 48-inch diameter tree and involve approximately 650 cubic yards of earthwork. In this alternative, housing is provided in tent cabins.

The eight double-occupancy tent cabins would be arranged in two clusters flanking a common bathhouse and an outdoor social space; the bathhouse would have an attached apartment for the cook. The tent cabins and bathhouse would be located in the flat area north of the new access road and parking. They would accommodate 17 employees including the cook. The manager would continue to be housed in existing facilities at Drakesbad Guest Ranch.

Each tent cabin would sit on a permanent wood deck supported by concrete piers. The tents would be constructed of a seasonal steel frame and fabric enclosure. The cabin footprint would be 14 feet by 14 feet (196 square feet) and the tent ridge would be approximately 15 feet above grade. At the center of each tent cluster would be an informal outdoor gathering space.

The new service center bathhouse would be a wood frame structure clad with wood lap siding and metal roofing, compatible in character with the structures in Drakesbad Guest Ranch. Overall dimensions would be 40 feet-6 inches by 31 feet-6 inches (1276 square feet) and the roof ridge would be approximately 25 feet above grade. The facilities would include four single-occupancy bathrooms with showers, one of which would be ADA-compliant. The bathrooms would be paired on the west and east sides of the building for proximity to each tent cluster. A lounge (10 feet-6 inches by 13 feet) would contain a sink and a counter and be located at the front of the bathhouse facing the primary outdoor space. A cook's apartment (463 square feet) would be located at the rear of the bathhouse. It would include one bedroom, an adaptable kitchen, an accessible bathroom, and a living/dining area. A five-foot wide porch would wrap three sides of the bathhouse and provide entry to all interior spaces as well as a laundry closet.



Warner Valley Comprehensive Site Plan
Figure 2-12
 Concessioner Housing and Service Center -
 Alternative 2 (Preferred)

SOURCE: Siegel & Strain

Utility mains and services would need to be extended to the building sites. Sewer and domestic water service would connect to the existing mains located in the road. Water service as it relates to fire protection would require new hydrants to be installed. Sprinkler systems, if required, would require booster pumps and additional water tanks. Sizing of all utilities would be based on demand requirements and hydrologic conditions, which would be determined during detailed design of all improvements. This alternative proposes to install a hybrid power system utilizing solar and geothermal sources and to utilize clean energy technology and move away from fossil fuel use.

A new storage and delivery building with a delivery dock for trucks would be constructed and would store food and supplies that are currently stored at Drakesbad Guest Ranch, thereby reducing truck traffic into Drakesbad Guest Ranch. In addition, this building would contain some of the materials currently stored outdoors in the existing bone yard. The remainder of the materials currently stored in the bone yard would be stored outdoors in a screened area adjacent to the propane tanks. The storage building would be a wood frame structure clad with wood lap siding and metal roofing, compatible in character with the structures in Drakesbad Guest Ranch. It would be 20 feet by 30 feet and the roof ridge would be approximately 24 feet above grade. The loading dock would be 5 feet by 8 feet and would sit perpendicular to the main structure on the downhill side of the building. The combined footprint of building and loading dock would be 640 square feet.

Small Scale Features

Dumpster

The preferred alternative would incorporate the dumpster in the new service center and restore the current location of approximately 100 square feet by removing existing gravel, decompacting the soil and by reseeding with native propagated seed. Removing the dumpster from its existing location will enhance the cultural landscape.

Generator

The generator would be relocated from Drakesbad Guest Ranch to the new service area. It would be housed in a new building of the same size and configuration as the existing building and would be designed to reduce noise. It would be a wood frame structure clad with wood lap siding and metal roofing, compatible in character with the structures in Drakesbad Guest Ranch. It would be 12 feet x 22 feet (264 sq. ft.) and the roof ridge would be approximately 15 feet above grade.

Propane Tanks

The preferred alternative would relocate the propane tanks to the new service center and restore the current location of approximately 50 square feet by removing existing gravel and concrete footing and by reseeding with native propagated seed. The tanks would require concrete footings. A new feed storage building would be built at the old propane tank site. Removing the propane tanks from their existing location will enhance the cultural landscape.

Site Storage at the 'Bone Yard'

The preferred alternative proposes relocating all storage to the new service center except feed for stock, which would be stored at the old propane tank site as described above. See description above for concessioner housing and service center for further description of the 'bone yard.' Removing the 'bone yard' from its existing location will enhance the cultural landscape.

Bathhouse and Pool

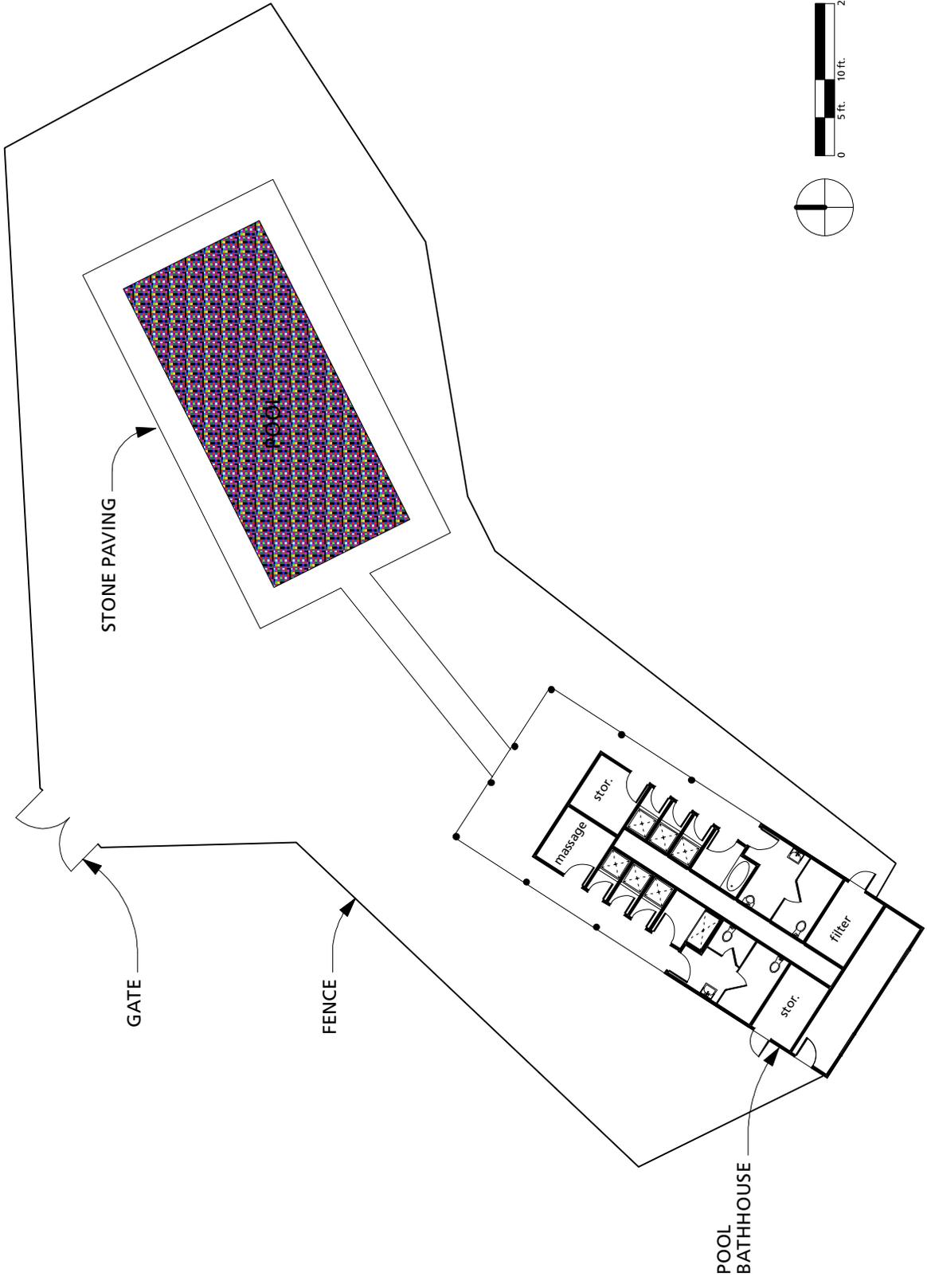
The preferred alternative would involve an addition to the existing pool bathhouse that would increase the number of showers; provide additional storage; provide ADA-accessible facilities; and relocate the pool equipment. In addition, it would provide photovoltaic power generation and water heating (**Figure 2-13**).

The existing bathhouse building would be extended 15 feet-6 inches toward the pool in order to add fixtures and to reconfigure the rooms. All plumbing fixtures and partitions would be replaced and all rooms except the storage room would be reconfigured. The bathhouse would contain an accessible women's restroom (two toilets, one sink), an accessible men's restroom (one toilet, one urinal, one sink), one accessible shower compartment, one tub/shower compartment, six standard shower compartments, one massage room, and a storage closet facing the pool. This would be an increase of three showers, a decrease of one bath compartment, and a decrease of four changing stalls. As in the existing bathhouse, rooms would be arranged along a plumbing chase and doors would open to a porch that wraps three sides of the building. The porch would be 3 feet deep at the north and south (an increase in depth to provide an accessible route of travel) and 10 feet deep facing the pool.

The existing filter house would be removed and the equipment would be relocated to a dedicated filter/pump room in the bathhouse. The storage/mechanical room at the rear of the bathhouse would remain as is. The materials in the addition would match the existing building materials. The overall dimensions of the bathhouse would be 23 feet-7 inches by 58 feet-6 inches, an increase of 365 square feet over the existing building. The current location of the filter house would be restored by reseeding area with weed-free lawn grass seed to match the existing turf around the pool.

A new rooftop photovoltaic array would provide electricity for running pumps and a new solar water heating system would supplement or replace propane-fired water heaters. Both systems would be located on the south side of the bathhouse roof, facing away from Drakesbad Guest Ranch, and would maintain current roof color and design. It may be possible to use water from the hot springs in a heat exchanging system (in lieu of the rooftop photovoltaic electrical producing system for water heating) to heat the water for restrooms and showers.

Pool coping and decking would be replaced with material more compatible to the historic material, such as stone. Sections of the eroding stream bank would be stabilized with native riparian plant species in a layered method (bioengineering).



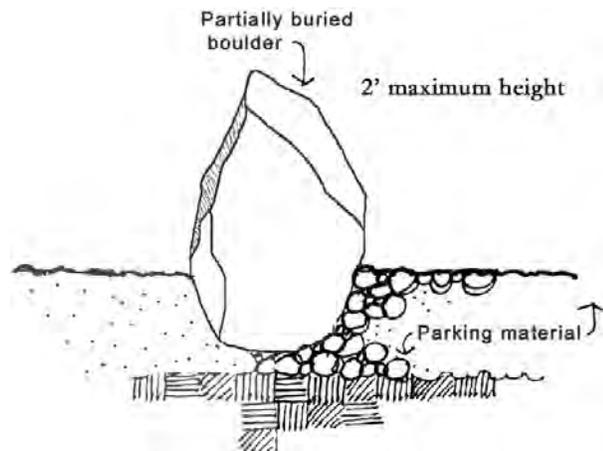
Warner Valley Comprehensive Site Plan
Figure 2-13
 Bathhouse and Pool -
 Alternative 2 (Preferred)

SOURCE: Siegel & Strain

Circulation at Drakesbad Guest Ranch

Parking

The preferred alternative would designate parking areas with rock barriers and limit overnight guest parking to two cars per unit. It would also designate short and long-term parking, close the loop road at the Mission 66 units and redirect overflow parking to the new day use parking area. Impacted areas would be restored by decompacting soil and reseeding and planting with propagated native plants as appropriate (**Figure 2-14**).



Parking Barrier, as recommended in the Cultural Landscape Report

Access Road to Water Tank

The preferred alternative proposes rebuilding this road with a permeable roadbed and narrower width than the current condition. This alternative would maintain the existing culverts for flows from the springs upslope.

Pedestrian Circulation

Walkways within Drakesbad Guest Ranch

The preferred alternative proposes no action within the Drakesbad Guest Ranch walkways. The existing condition is detailed in Section 2.1.1.

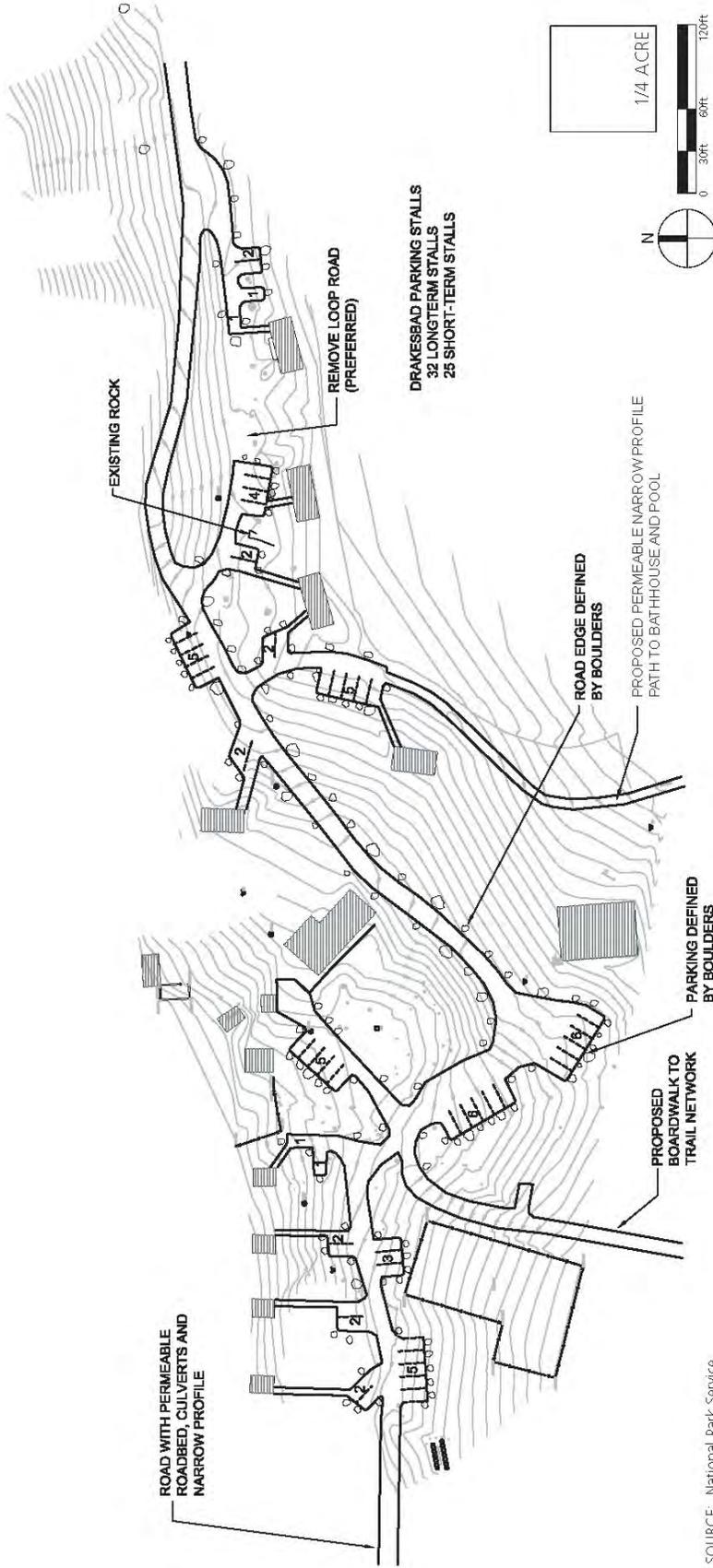
Access Road / Path to Pool and Bathhouse

The preferred alternative would replace the existing road/path with a narrower profile of approximately 7 feet suitable for smaller service vehicles. It would also replace the base of the path with permeable base rock to allow sub-surface water flow through the meadow. The surface of the path would consist of grass cell pavers with native grasses on surface, see the *Cultural Landscape Report* for detailed construction techniques for 'Turnpikes') (NPS, 2005). The bathhouse systems would be redesigned to eliminate need for propane delivery truck to pool. The bathhouse energy system would either use a photovoltaic electrical producing system or propane that would be run in underground lines from the service area.

Trail from the Corral across the Meadow/Fen to the Trail Network

The preferred alternative would construct boardwalks over existing trails to allow the natural water flow patterns to be restored. Construction would include the following major components:

- remove causeway material from the meadow and dispose of 22 cubic yards of soil;
- restore the impacted area by reseeding with propagated native plants as appropriate; and
- construct a boardwalk approximately 6-8 feet in width based on site specific requirements.



SOURCE: National Park Service

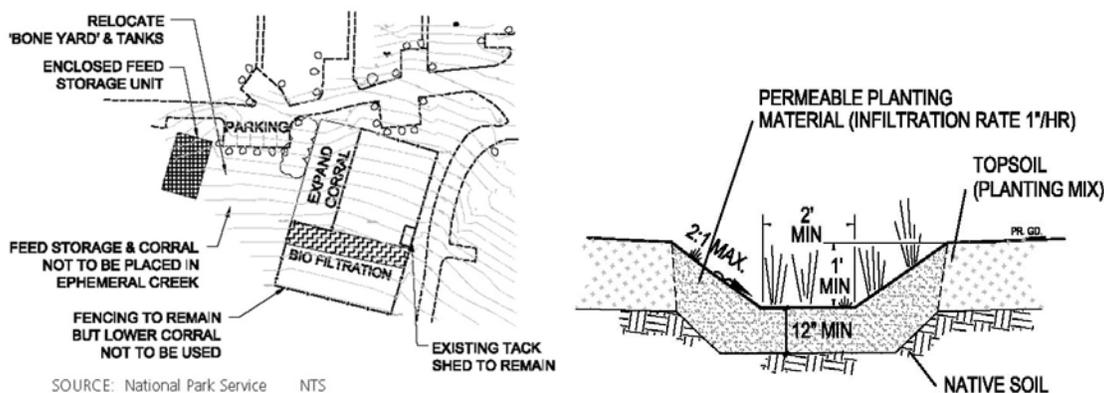
Warner Valley Comprehensive Site Plan

Figure 2-14
Drakesbad Guest Ranch Circulation –
Alternative 2 (Preferred)

Land Use

Corral

The preferred alternative proposes reconfiguring the corral in its current location and eliminating use of the lower corral (**Figure 2-15**). The lower corral would be maintained as a part of the cultural landscape, but not used. Additional corral space would be located in the area now occupied by the ‘bone yard’. The space would not extend into the ephemeral creek between the existing ‘bone yard’ and propane tanks. A bio-filtration system would be added on the southern edge of the corral to mitigate effluent. The abandoned two barrel fire hydrants below the corral would be removed. As described earlier, the new enclosed feed storage structure would be built adjacent to the corral where the old propane tanks were located. Use of seed-free feed would be required. The building would have a footprint of 24 feet by 40 feet and would be a pole barn structure with wood siding and metal roof, compatible in character with the existing Drakesbad Guest Ranch buildings. The ridge of the gable roof would be 26 feet in height. The existing tack shed would remain.



Warner Valley Comprehensive Site Plan

Figure 2-15
Corral – Alternative 2 (Preferred)
Bio-Filtration System

Volleyball Court

Under the preferred alternative the volleyball court would be removed and the disturbed area restored by removing the sand and reseeding the area with native plants.

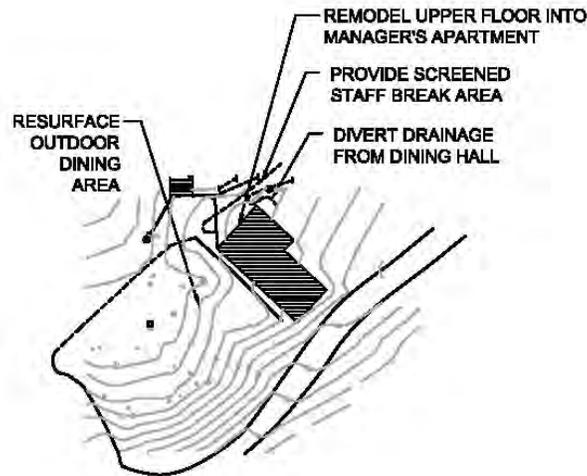
Dining Hall Service Area

The preferred alternative would re-configure the area to be more useful, efficient, and attractive.

Key elements would:

- relocate non-essential uses to a new service center including the concessioner housing, fuel tank, generator (generator building is non-contributing and would be removed), and storage;

- provide a picnic table on a small patio as an employee break area;
- re-grade the area to direct surface flow away from the building and catching run-off with a drainage system uphill from the dining hall (direct flows to adjacent wetland area); and
- bury the electrical lines.



Warner Valley Comprehensive Site Plan •

Figure 2-16
Dining Area – Alternative 2 (Preferred)

Outdoor Dining Area

The preferred alternative would resurface the patio with a material more compatible with the site and more accessible, such as wood decking, soil cement or stained concrete. It would maintain the current size and number of tables and chairs. To enhance the dining experience, the adjacent parking would be relocated – see parking section.

Exterior Porch Walls at Cabins # 9, 10, 11, 12

The preferred alternative would replace the exterior porch concrete block walls with stone walls to be more compatible with the historic character.

Drakesbad Meadow

Based on the recommendations of the Patterson study (Patterson, 2005), the preferred alternative would restore fen ecology through filling man-made features with fill material (permanent restoration). Actions are needed to more fully restore the functions and values of this natural resource. To complete the restoration of the Drakesbad Meadow fen-complex, all structures that divert either groundwater or surface water flowpaths, including roads, ditches and impoundments should be analyzed. Patterson recommends the long-term restoration of drainage ditches and the water tank road to re-establish historic flowpaths by removing the road, and re-grading and re-vegetating the hillslope. Re-flooding of some trails as a result of these measures may require additional construction of boardwalks. Use of seed-free feed for stock, enclosed storage for hay

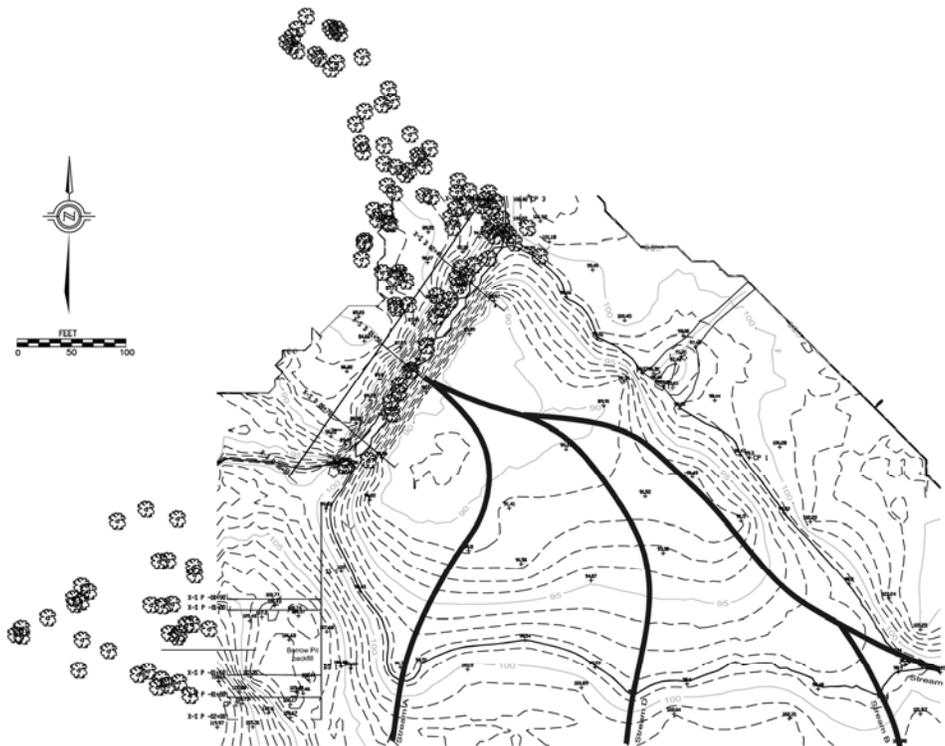
and feed, and new biofiltration system of horse manure to minimize introduction of non-native seed to the fen would be required. See related section on the corral.

Dream Lake Dam

The preferred alternative proposes removing Dream Lake Dam and restoring the area to a stream channel.

The dam removal and restoration project would include topographic re-contouring and require the use of tools, machinery and heavy equipment at the project site (**Figure 2-17**). The equipment would need to be either airlifted to the site or brought in over temporary roads through Drakesbad Meadow and across Hot Springs Creek. An additional option would be to bring heavy equipment through the meadow over snow, before complete snowmelt and ground thaw.

Prior to dam removal, approximately 32 lodgepole pine and alder trees ranging from 2 inches to 18 inches dbh (diameter at breast height) would need to be removed from the dam embankment and its margins, and the dam would need to be cleared of roots and stumps. No specimen trees or snag trees would be removed. Trees and shrubs would also need to be removed from the old borrow pits, so that the excavated dam materials could be returned and the area could be re-graded.



Warner Valley Comprehensive Site Plan ■

Figure 2-17
Dream Lake Dam – Alternative 2 (Preferred)

The lake would be drained by implementing a controlled breach in the late fall or early winter prior to removal. The water would be lowered by notching the dam, one to two feet at a time, using small equipment. The lake bottom would be allowed to sit over the winter. The following spring/summer, the embankment would be removed and soils replaced in the old borrow pits. The sediments stored behind Dream Lake Dam would also be excavated and are of a quality that could be used in any or all of the following ways: (a) re-grade the site for channel restoration; (b) fill and re-contour the existing borrow pits or (c) haul off-site and store for use by the NPS at a later date.

The dam and lake locale would be re-naturalized and would include a channel network stabilized by log and rock step-pools. Some tree encroachment may occur, but a narrow floodplain wetland will always exist. The four stream channels would be re-naturalized, with average streambed slopes of 2.5 to 3.5 percent. Conceptually, a certain amount of cut and fill would need to occur to re-establish the channels. The area would be re-vegetated and could become a riparian and wetland habitat (see **Figure 2-17a** and **b**).

2.1.3 Alternative 3

Entry to Warner Valley

Alternative 3 proposes two major improvements to the area; relocating the fee station and improving the existing road to the water tank.

Fee Station

For the fee station, the iron ranger (receptacle for fees) would move in front of the vault toilet adjacent to the ranger station and three parking spaces would be provided for visitors; parking would be defined with buried rocks or logs. No tree removal would be required. This alternative would require minor grading to level the area and to incorporate the fill generated by construction of an apron for the road to the water tank (**Figure 2-18**).

Access Road to Water Tank at Ranger Station

At the road to the water tank, a culvert would be installed in the drainage ditch to decrease erosion, and a chain gate would be added to limit access to the water tank and to eliminate confusion over the purpose of this road. The entrance to the road would be stabilized with an apron of concrete or grass-crete cells to minimize erosion. The apron would require 6-inch cuts generating approximately 1 cubic yard of cut that could be used at the parking area for the fee station.

Warner Valley Road Improvements and General Road Maintenance

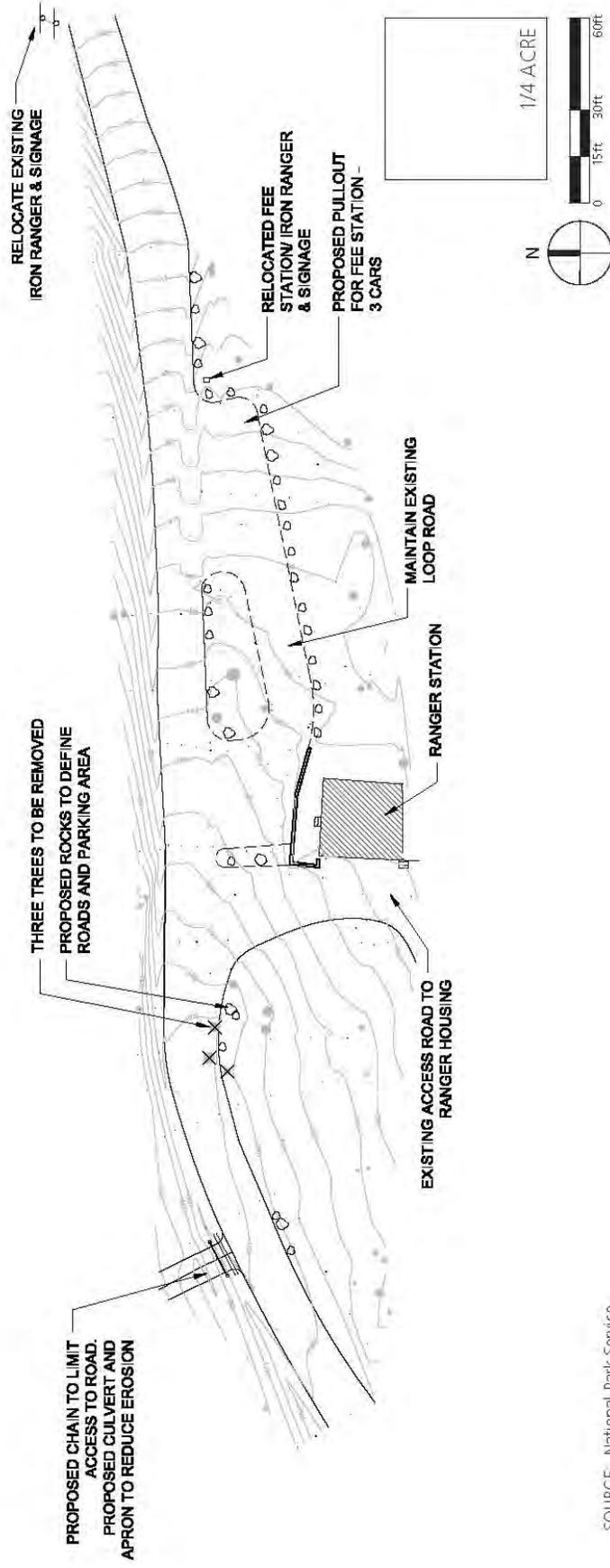
Under this alternative, the road at the blind curve just west from the ranger station would be widened on the uphill side and two-way traffic would be maintained. The road widening would include the addition of a drainage ditch on the uphill side to decrease erosion. Proposed improvements under this alternative would include replacing undersized and/or failing culverts along the entire length of Warner Valley Road, installing rock headwalls and installing uniform



Figure 2-17a - Existing Dream Lake Dam



Figure 2-17b - Post-Dream Lake Dam Removal Rendering



SOURCE: National Park Service

Warner Valley Comprehensive Site Plan

Figure 2-18
Entry to Warner Valley – Alternative 3

aggregate to reduce road dust and improve stability. Alternative 3 would include actions outlined in the Warner Valley Road culvert inventory, which recommends adding (6) new culverts, replacing (16) existing culverts and doing minor maintenance on (9) culverts (see Appendix A).

Campground, Trail, and Day Use Parking

Alternative 3 proposes closing the lower campground and relocating the day use parking and trailhead to this location. The existing day use area would be completely restored as described under Alternative 2.

Details of the proposed changes to the Pacific Crest Trail are the same as described under Alternative 2.

The upper campground improvements would be the same as described under Alternative 2, however the five campsites displaced by the closure of the lower campground would not be relocated here resulting in an overall loss of those campsites.

Drakesbad Guest Ranch

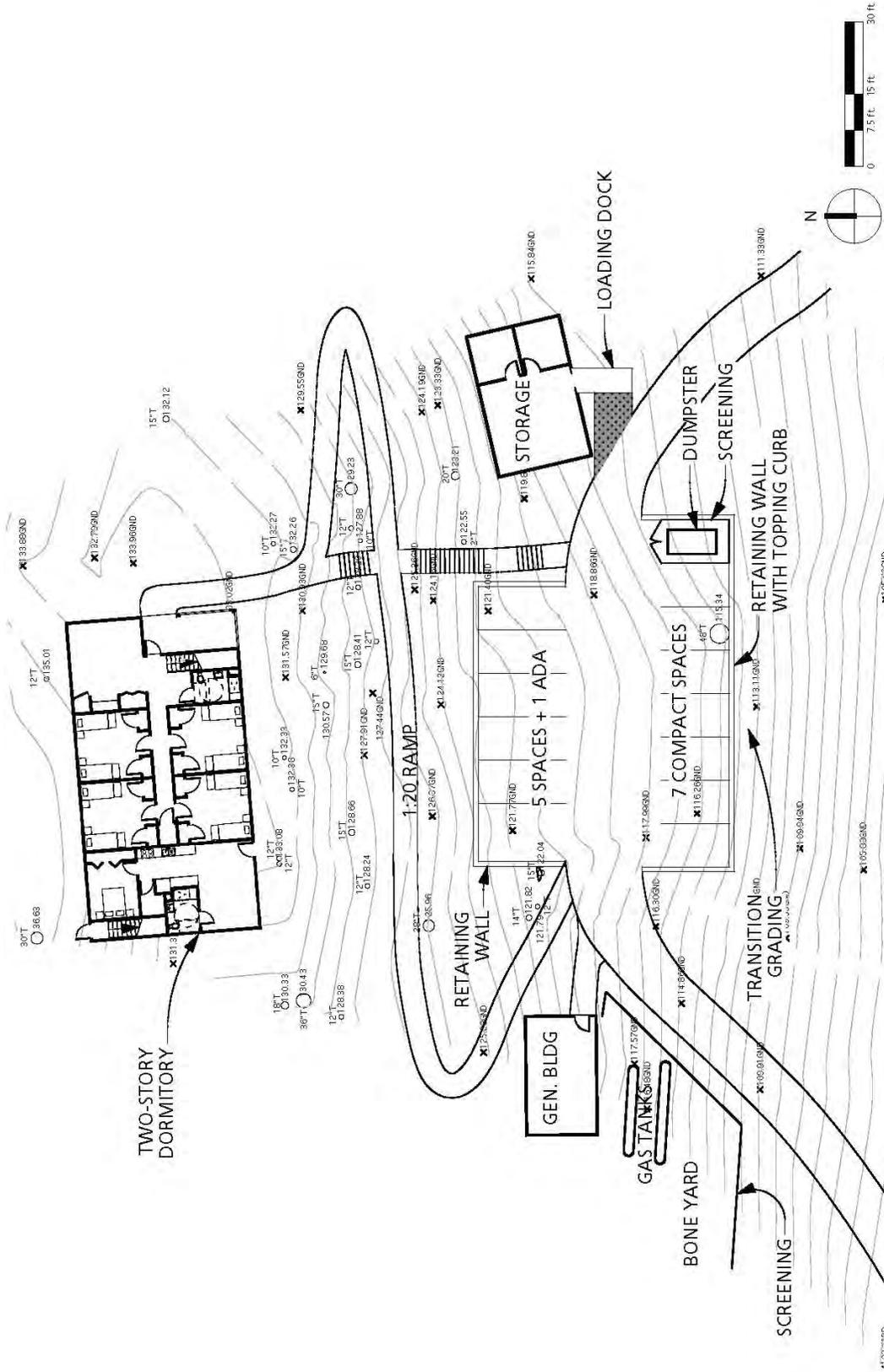
Concessioner Housing and Service Center

Alternative 3 proposes a new service center outside the historic district with staff housing provided in a two-story building. The design would include staff housing and bathrooms/showers (for 16 employees), an apartment for the cook, indoor and outdoor social areas for staff, enclosed storage to replace the 'bone yard', dry storage and refrigerated storage currently at Drakesbad Guest Ranch, and a hybrid power system including photovoltaic panels and a diesel generator.

The staff housing would consist of a two-story dormitory with a cook's apartment. The dormitory would be a wood frame structure clad with wood lap siding and metal roofing, compatible with the buildings at Drakesbad Guest Ranch. The overall dimensions of the dormitory building would be 35 feet-6 inches by 66 feet-6 inches and the roof ridge would be 38 feet above grade (**Figure 2-19**).

As in the preferred alternative, this proposed site is east of the historic district and would occupy a relatively flat bench several hundred feet north of the road. New construction would be fairly well hidden from the road. A short loop road would provide vehicle access to this area. Impacts to wetland areas that border both sides of the building site would be avoided. Construction would require removal of one 12-inch diameter, one 20-inch diameter and one 48-inch diameter tree and involve approximately 650 cubic yards of earthwork.

The double-occupancy dorm rooms and the shared bathrooms would be distributed on two floors and accessed from an interior corridor. A cook's apartment would be accessed from a separate entry at the east end of the building. Group social amenities at the west end of the building would include an outdoor gathering space in the flat area facing the entry, a front porch, and an employee lounge. The dormitory would be located on the east side of the flat area north of the new access road and parking.



Warner Valley Comprehensive Site Plan • **Figure 2-19**
 Concessioner Housing and Service Center –
 Alternative 3

The first floor (2361 square feet) would contain four double rooms (14 feet by 15 feet each with two closets), one accessible bathroom with shower, an employee lounge (15 feet by 15 feet with laundry closet and kitchen counter/sink), and a cook's apartment (593 square feet) with one bedroom, an accessible bathroom, an adaptable kitchen, a mechanical/laundry closet, and a dining/living area). The second floor would be accessed via two stairways: one from the first floor entry and another directly from the exterior.

The second floor (1568 square feet) would contain three double rooms (14 feet by 15 feet each with two closets), two single rooms (9 feet by 15 feet each with one closet), and two single-occupancy bathrooms with showers (Figure 2-19).

A new storage and delivery building with truck delivery dock would be constructed, as in Alternative 2, that would store food and supplies that are currently stored at Drakesbad Guest Ranch, thereby reducing truck traffic into Drakesbad Guest Ranch. In addition, this building would contain some of the materials currently stored outdoors in the existing 'bone yard'. The remainder of the materials currently stored in the 'bone yard' would be stored outdoors in a screened area adjacent to the relocated propane tanks. The storage building would be a wood frame structure clad with wood lap siding and metal roofing, compatible in character with the structures in Drakesbad Guest Ranch. It would be 20 feet by 30 feet and the roof ridge would be approximately 24 feet above grade. The loading dock would be 5 feet by 8 feet and would sit perpendicular to the main structure on the downhill side of the building. The combined footprint of building and loading dock would be 640 square feet.

Utility mains and services would need to be extended to the building sites. Sewer and domestic water service would connect to the existing mains located in the road. Water service for fire protection would require installation of new hydrants. Sprinkler systems, if required, would require booster pumps and additional water tanks. Sizing of all utilities would be based on demand requirements and hydrologic conditions, which would be determined during detailed design of all improvements. This alternative proposes to install a hybrid power system utilizing solar and geothermal sources which would utilize clean energy technology and move away from fossil fuel use.

Small Scale Features

Dumpster

This alternative will be the same as Alternative 2.

Generator

The generator would be relocated from Drakesbad Guest Ranch to the new service area, as in Alternative 2. It would be housed in a new building of the same size and configuration as the existing building. It would be a wood frame structure clad with wood lap siding and metal roofing, compatible in character with the structures in Drakesbad Guest Ranch. It would be 12 feet by 22 feet (264 square feet) and the roof ridge would be approximately 15 feet above grade. The existing propane tanks would be relocated to the new service area, as in Alternative 2, in an area of approximately 50 square feet.

Propane Tanks

This alternative will be the same as Alternative 2.

Site Storage at the 'Bone Yard'

Under this alternative all storage would be relocated to the new service center with the exception of feed for stock, which would be located in a new feed shed adjacent to the new corral.

Bathhouse and Pool

Alternative 3 would include an addition to the existing bathhouse that would increase the number of showers, toilets and massage facilities; provide additional storage; provide accessible facilities for the disabled; and relocate the pool equipment. This component is the same size as Alternative 2, but has a different layout. In addition, it would provide photovoltaic power generation and water heating.

The existing mechanical room, women's restroom (two toilets, one sink), and men's restroom (one toilet, one urinal, one sink) would remain at the rear of the building, as in their existing configuration.

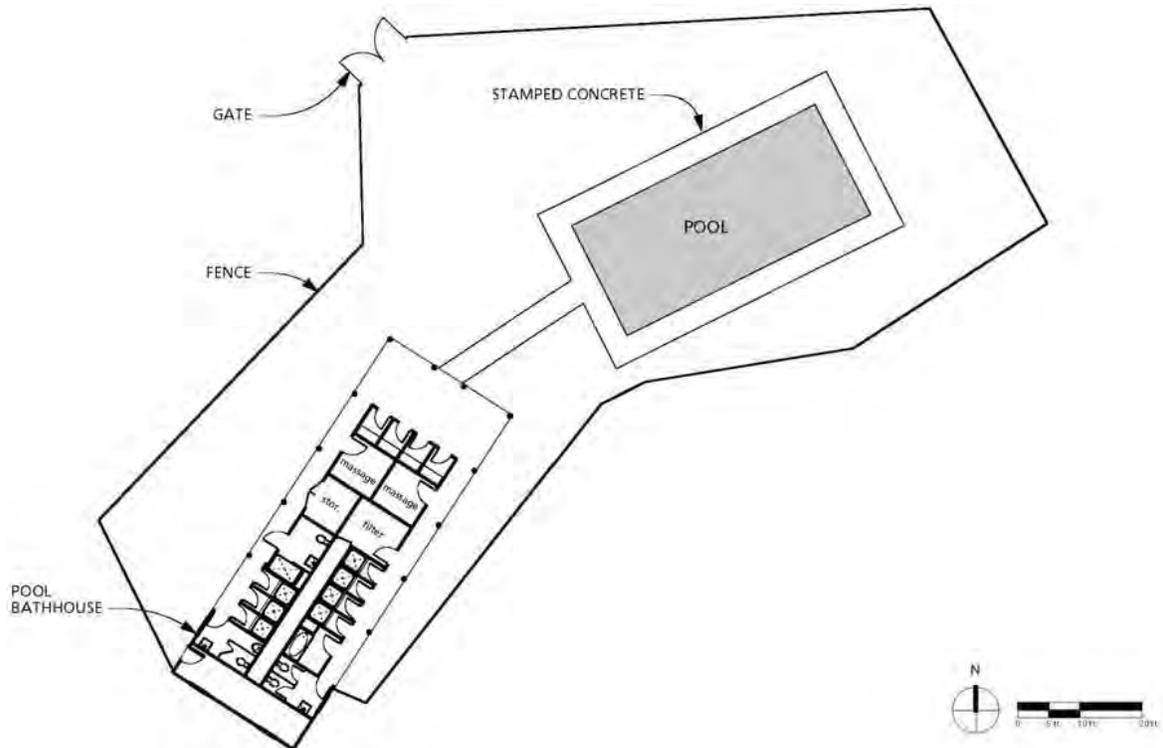
The existing bathhouse would be extended 22 feet-2 inches toward the pool and would include the following: one single-occupancy accessible restroom with shower, one bathtub compartment, seven shower compartments, four changing stalls facing the pool, two massage rooms, one filter room and one storage closet in the middle of the building. This would be an increase of one toilet, one sink, four showers and one massage room; and a decrease of one bath compartment.

As in the existing bathhouse, rooms would be arranged along a plumbing chase and doors open to a porch that wraps three sides of the building. The porch would be 3 feet deep at the north and south (an increase in depth to provide an accessible route of travel) and 10 feet deep facing the pool. The materials in the addition would match the existing building materials. The overall dimensions of the bathhouse would be 23 feet-7 inches by 65 feet-5 inches, an increase of 523 square feet over the existing building (**Figure 2-20**).

The existing filter house would be removed and the equipment would be relocated to a dedicated filter/pump room in the bathhouse. Guests would walk past the filter/pump room to access showers and toilets.

A new rooftop photovoltaic array would provide electricity for running pumps and a water heating system would supplement or replace propane-fired water heaters. Both systems would be located on south side of the bathhouse roof, facing away from Drakesbad Guest Ranch, and would maintain current roof color and design.

Pool coping and decking would be replaced with material more compatible with the historic material, such as stone paving. Sections of eroding stream bank would be stabilized with native riparian plant species in a layered method (bioengineering).



Warner Valley Comprehensive Site Plan ■

Figure 2-20
Bathhouse and Pool – Alternative 3

Circulation at Drakesbad Guest Ranch

Parking

This alternative will be the same as Alternative 2.

Access Road to Water Tank

Alternative 3 would add additional culverts under the existing road to improve flow of the spring water to Warner Valley. This would be the continuation of an existing improvement program (Figure 2-21).

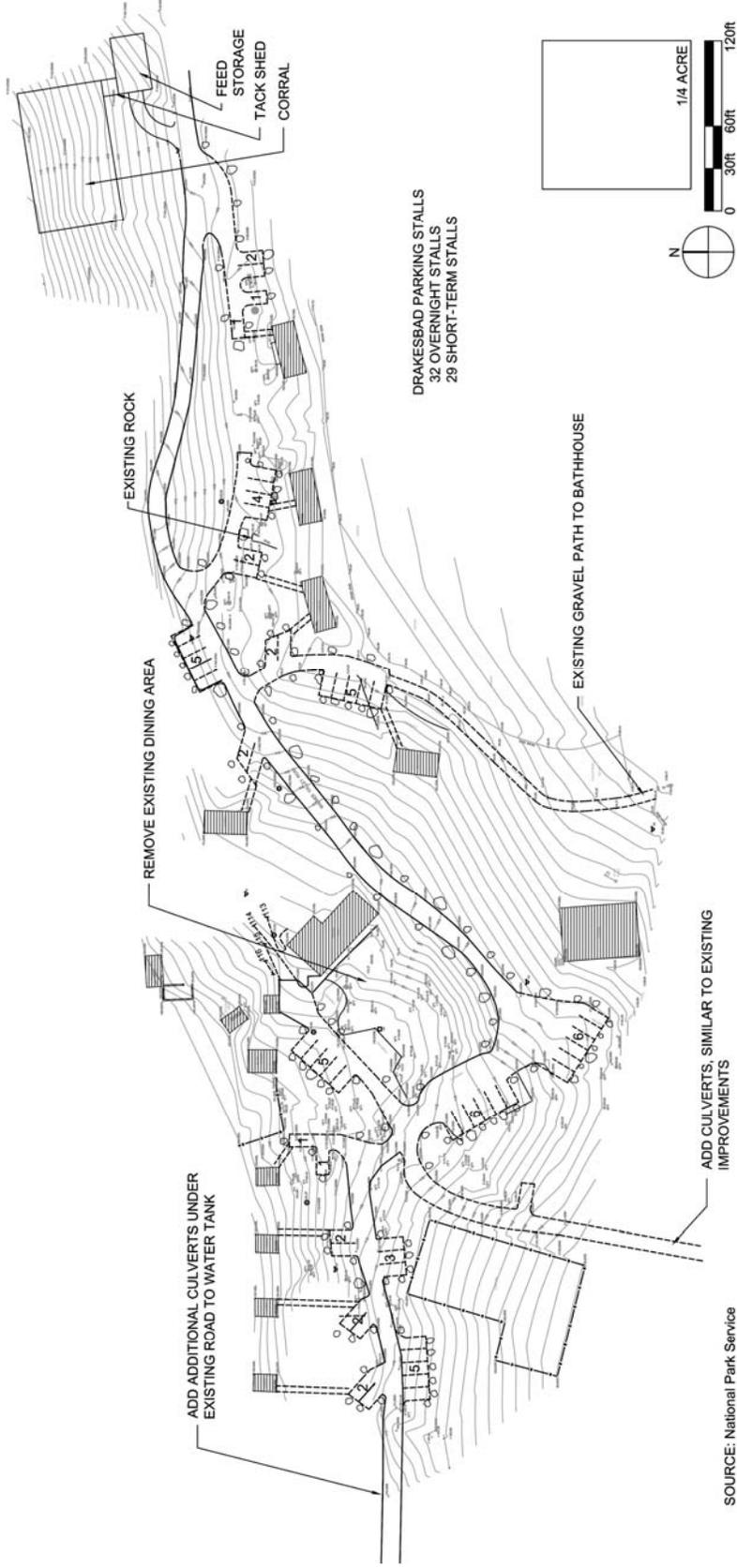
Pedestrian Circulation

Walkways within Drakesbad Guest Ranch

Alternative 3 would minimize the number of paths and define trails with low stones, in keeping with the character of the historic trails.

Access Road / Path to Pool and Bathhouse

Replace existing road with a boardwalk that could be constructed for use by an electric golf cart or smaller service vehicle



SOURCE: National Park Service

Warner Valley Comprehensive Site Plan

Figure 2-21
Drakesbad Guest Ranch Circulation – Alternative 3

Trail from Corral across Meadow/Fen to the Trail Network

Alternative 3 would continue the improvements made over the last three years with construction of additional culverts.

Land Use

Corral

Alternative 3 would construct a new corral and feed storage in a different location, but still use the existing location for staging of rides. The horses would no longer be housed where they are staged. The lower corral would be maintained as part of the cultural landscape, but not used. The upper corral would be used for staging, and a biofiltration system would be added to mitigate effluent. The existing tack shed would remain and the two barrel fire hydrants and the water line below the corral would be removed (**Figure 2-22**).

The new corral and feed storage building would be located on a site north of Warner Valley Road, just at the entrance to the historic district, across from the existing lift station (**Figure 2-23**). The corral would be approximately 60 feet by 100 feet and would be enclosed with wood fencing similar to the existing corral. The new corral location may require site grading to reduce the side hillslope. The new feed storage building would be of the same design as in Alternative 2. It would be 24 feet by 40 feet and would be a pole barn structure with wood siding and a metal roof, compatible in character with the existing Drakesbad Guest Ranch buildings. The ridge of the roof would be 26 feet in height. A new tack shed would be constructed on the uphill side of the building and would be the same size as the existing tack shed. A short gravel driveway would lead from the road to the feed storage building to provide for delivery of feed.

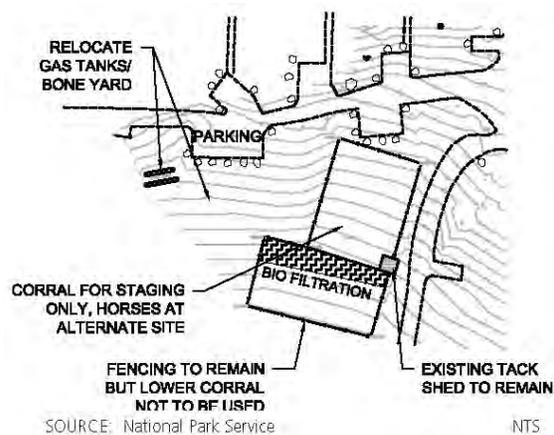


Figure 2-22
Corral – Alternative 3

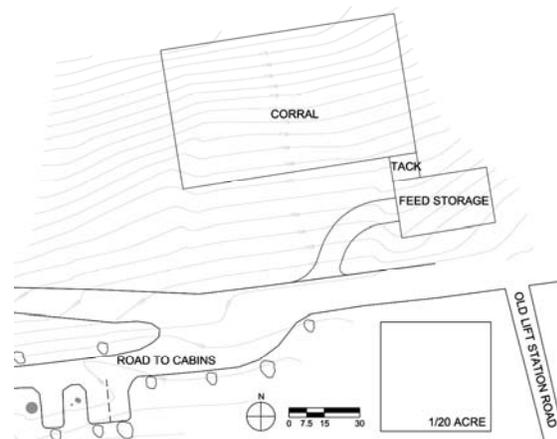


Figure 2-23
Corral Alternate Location –
Alternative 3

Volleyball Court

This alternative would remove the volleyball court and restore the disturbed area by removing the sand and reseeding the area with native plants.

Dining Hall Service Area

Alternative 3 would include re-configuring the area to be more useful and efficient. The area would be lightly re-graded to direct surface flow away from building and catch run-off with drainage system uphill from the dining hall and direct flows to adjacent wetland area. Electrical lines would be buried. The parking near the outdoor dining would remain in the existing location (**Figure 2-24**).

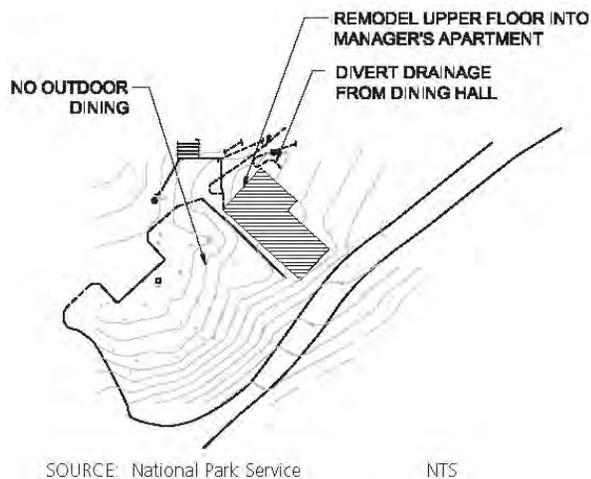


Figure 2-24
Dining Area – Alternative 3

Outdoor Dining Area

Alternative 3 proposes the removal of the outdoor dining area.

Exterior Porch Walls at Cabins # 9, 10, 11, 12

Alternative 3 would include covering the existing exterior porch concrete block walls with a stone veneer.

Drakesbad Meadow

Alternative 3 proposes to increase ongoing measures for improvement such as installing metal check dams at key points in the drainage ditches and installation of culverts under roads and trails to improve sheet flow. In this alternative, the ditches would not be filled in with soil, but rather metal sheets would be put in place to block water flow. The use of seed-free feed for stock would be required, as would enclosed storage for hay and feed and improved clean-up of horse manure to minimize introduction of non-native seed to the fen.

Dream Lake Dam

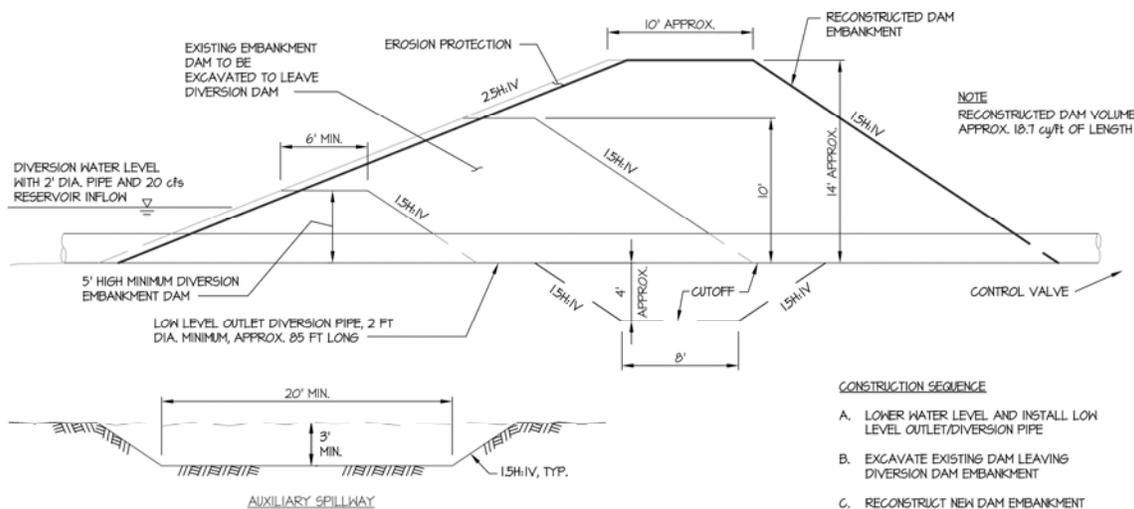
This alternative would reconstruct the existing Dream Lake Dam to meet Bureau of Reclamation standards. Repair of the existing dam is not feasible due to the moisture content of the embankment soils. This alternative would follow recommendations outlined in the *Title I Schematic Design Report* for Dream Lake Dam, which outlines an approach for construction of an earthen fill embankment. This can be constructed either after partial excavation of the existing dam structure, utilizing that portion of the base for the existing structure that can safely remain, or the excavation and reconstruction of the entire existing dam structure (Kennedy/Jenks, 2007). The dam reconstruction project would require the use of tools, machinery and heavy equipment at the

project site. The equipment would need to be either airlifted to the site or brought in over temporary roads through Drakesbad Meadow and across Hot Springs Creek. An additional option would be to bring heavy equipment through the meadow over snow, before complete snowmelt and ground thaw.



Dream Lake Dam

Prior to construction, approximately 32 lodgepole pine and alder trees ranging in size from 2 inches to 18-inches dbh would need to be removed from the dam embankment and its margins, and the dam would need to be grubbed. No specimen trees or snag trees would be removed. The lake would be de-watered by implementing a controlled breach in the late fall or early winter prior to construction. The water would be lowered by notching the dam, one to two feet at a time, using small equipment. The lake bottom would be allowed to sit over the winter. After dewatering, a large portion of the existing dam would be removed, leaving a low diversion embankment that would aid in diversion during construction. The new dam would be constructed over the diversion embankment, using new, suitable materials (**Figure 2-25**).



Warner Valley Comprehensive Site Plan

Figure 2-25
Dream Lake Dam – Alternate 3

(This assumes that the foundation is suitable to remain.) The new dam would be higher than the existing dam in order to provide sufficient freeboard and would include a new spillway, approximately 20-feet wide and of sufficient capacity to function without beaver interference. The diversion or low level outlet would be outfitted with a trash rack, stilling basin, sand filter, and a bullhead gate and valve box. An energy dissipater would be installed downstream. Suitable soil materials for reconstructing the dam embankment would be imported to the park. In addition, suitable rock materials would be imported to the dam site for the rip-rap that would be needed on the upstream dam face, as well as for the emergency spillway channel. Existing embankment materials could be used for top dressing over the dam core.

2.2 Environmentally Preferred Alternative

In accordance with Director's Order # 12, the NPS is required to identify the "environmentally preferred alternative" in all environmental documents, including environmental impact statements. Identifying the environmentally preferred alternative is not the same as selecting a "preferred alternative" for implementation. The NPS is not required to select the environmentally preferred alternative as the final preferred course of action. The preferred course of action described in this EIS is Alternative 2 as detailed above.

An environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969, which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act," which considers:

- Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieving a balance between visitor and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, Section 101).

It is anticipated that the No Action Alternative, Alternative 1, would not have considerable environmental benefits compared to the other action alternatives. In fact, the Plan has been developed to address a number of issues of natural resource degradation and visitor and staff

safety. As the No Action Alternative would not address these issues, it is not the environmentally preferred alternative. Under existing conditions there are many instances of current roads and parking areas associated with erosion and encroachment into natural areas. For instance, the existing day use parking is located in a wetland area and because it is insufficient in size to accommodate parking for the day users, it imposes on wetland resources.

With regards to the natural resources, Drakesbad Meadow is affected under existing conditions because effluent from the corral area flows into the meadow. In addition, seed from hay allows non-native grasses to spread into the meadow and wildlife feed on the hay. The introduction of non-native vegetation species and a reduction in water flows to the meadow has degraded this major natural and cultural resource. These factors have also led to both the proliferation of pocket gophers and their destructive tunnels, and the reduction of native wetland species that require water flow.

Under the No Action Alternative, or existing conditions, Dream Lake Dam has significantly altered local hydrology on the south slopes of Warner Valley, associated with a reduction in riparian habitat. The overall lack of maintenance at the dam and beaver activity has left the dam in a weakened state with a risk of failure

Under the No Action Alternative, or existing conditions, visitor and staff safety may be compromised by several factors. At the entrance to Warner Valley, the fee station is located on a blind curve, so any cars stopped in the road cannot be seen until the last moment by traffic coming into the Valley. Safety issues also exist where campsites are in close proximity to the creek and the road. In addition, the current concessioner housing is not large enough to house the staff members and is of substandard construction. Staff are housed in trailers. These trailers and the bone yard have a visual impact on the cultural landscape and detracts from the visitor experience.

Both the action alternatives (Alternative 2 and Alternative 3) offer benefits in the areas of conservation, restoration, and interpretation and therefore, these alternatives are consistent with fulfilling the criteria listed under Section 101 of NEPA. Selecting the environmentally preferred alternative need not be the same as “preferred alternative” for implementation. However, based on the analysis in this EIS, Alternative 2, as well as being the preferred alternative is also in this case the environmentally preferred alternative. This determination is made due to improvements and upgrades that would resolve the natural resource and safety impacts discussed above. Under Alternative 2, the removal of the Dream Lake Dam would ensure that the historic stream channels that currently feed the lake would be restored. The goal of the Plan is that this action will result in a significant increase in riparian and wetland habitat in that area. Restoring this natural riparian system will provide the most sustainable natural environment both for local species but also for succeeding generations of park visitors.

Alternative 3 addresses many of the natural resource and safety issues found under existing conditions with some alteration in configurations and capacity as described in this Chapter. However, Alternative 3 does not include removal of Dream Lake but instead proposes reconstruction of the existing Dream Lake Dam through construction of an engineered earthen fill

embankment either after partial excavation of the existing dam structure, utilizing that portion of the base for the existing structure that can safely remain, or the excavation and reconstruction of the entire existing dam structure. The dam reconstruction project would require the use of tools, machinery and heavy equipment at the project site. The equipment would need to be either airlifted to the site or brought in over temporary roads through Drakesbad Meadow and across Hot Springs Creek. Construction impacts from this project, and the fact that the environmental benefits from the removal of Dream Lake would not be realized under Alternative 3 led to the conclusion that Alternative 3 is not the environmentally preferred alternative.

2.3 Actions Considered But Dismissed

Under NEPA, an alternative may be eliminated from detailed study for one or more of the following reasons:

- inability to meet project objectives or resolve the need for the project;
- duplication of other, less environmentally damaging alternatives;
- conflicts with an up-to-date valid plan, statement of purpose and significance, or other policy and therefore would require a major change in that plan or policy to implement;
- environmental impacts are too great; and
- technical or economic infeasibility.

Those alternative actions considered but eliminated from detailed study are described below.

Warner Valley Road Improvements

This alternative proposed construction of a new road cut to accommodate one-way traffic inbound, and use of the existing alignment for outbound traffic. The new road would raise the grade over the existing culvert across the stream channel requiring lengthening of the culvert and the construction of a rock outfall structure in keeping with historic landscape. This road would eliminate the blind curve but would require extensive earthwork and the removal of trees. This alternative was dismissed due to the potential environmental damage and conflicts with protecting a cultural resource.

Drakesbad Guest Ranch

Concessioner Housing and Service Facilities

This alternative would have placed staff housing along the north side of Warner Valley Road, across from the eastern most duplex. This site was determined to be undesirable due to its proximity to the Warner Valley Road and its being within the historic district of Drakesbad Guest Ranch.

Small Scale Features

Dumpster

This alternative would have relocated the dumpster to the existing 'bone yard' and provided screening. It would have restored the current location of approximately 100 square feet by removing the existing gravel and by reseeding with native propagated seed. In the discussed and dismissed section the dumpster, propane tanks, and 'bone yard' alternatives were in conflict with each other.

Propane Tanks

This alternative would have screened the tanks with fencing and native vegetation and restored the current location of approximately 50 square feet by removing existing gravel and concrete footing and reseeding with native propagated seed. Removing the propane tanks and replacing them with alternative fuel sources, such as solar power was considered. It was determined unfeasible given the amount of photovoltaic panels needed to offset the amount of energy lost, so this alternative was dismissed.

Site Storage at the 'Bone Yard'

This alternative would have screened the storage area with fencing and native vegetation and provided an enclosed container to minimize intrusion by wildlife for stock feed. An enclosed container in this location would not be large enough to store all the feed for 20-24 horses. It would require trucking feed from the feed storage building to this site on a frequent basis, therefore making it an operational problem.

Circulation at Drakesbad Guest Ranch

Access Road to Water Tank

The removal and relocation of the current access road to the water tank was discussed as an alternative. It was determined that relocation of the water tank would require a pressurized system, requiring back-up power to maintain flows for fire protection needs. This alternative would require much more infrastructure than a gravity-fed system, and was therefore dismissed. Relocating the water tank, intake and access road, would also have a negative impact on any new location.

Pedestrian Circulation

Trail from Corral across Meadow/Fen to Trail Network

Narrowing the trail from the corral across the meadow/fen to the trail network was discussed and dismissed. It was determined to not meet the usage demands and environmental goals.

Path to Pool and Bathhouse

Placing culverts under the existing path was considered but dismissed. The existing path is below grade, so culverts would be below grade as well and therefore would not function.

Land Use

Corral

Relocating the corral to the new service area was discussed. It was dismissed due to the negative effects on the cultural landscape from losing the historical use at Drakesbad Guest Ranch. Operational impacts on the new site and difficulty of staging rides were also factors in dismissing this alternative.

Other

The following are issues which were raised during public scoping and are beyond the scope of this plan: hydrothermal activity; chlorinated water from the pool entering the creek; setting aside rooms at Drakesbad Guest Ranch for lower income people; changing demographics in California; campsites accommodating small recreational vehicles and horse trailers; huts for winter ski-in use; and emergency egress routes out of Drakesbad Guest Ranch.

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CHAPTER III

Affected Environment

3.1 Geologic Resources and Hazards

Introduction

A primary objective of the Warner Valley Comprehensive Site Plan (Plan) is to protect the unique natural resources found in the Warner Valley area, which includes preserving the natural geologic environment, volcanic features, and soil resources. This section outlines the geologic features of the Warner Valley area that would likely be affected by the efforts under the Plan to protect natural processes and cultural and wilderness resources. Sources accessed for this section include the *Warner Valley Comprehensive Restoration and Preservation Site Plan (2008)*, and the *General Management Plan and Final Environmental Impact Statement, Lassen Volcanic National Park (2002)*.

Local Geology

Warner Valley marks the southern edge of the Lassen plateau. The Warner Valley is the eroded center of the Mt. Ditmar volcano and consists of volcanic rocks, glacial landforms, and recent volcanic flows (NPS, 2008). The center of the Warner Valley features a large meadow that is one of the largest known fens in the western United States. The Drakesbad Meadow area has a number of faults, including a normal fault¹ that extends 2.4 miles southeast from a hot spring at the southern edge of Drakesbad Meadow to the Boiling Springs Lake geothermal area. An additional normal fault originates at Boiling Springs Lake and extends to the Devils Kitchen geothermal area, 4.8 miles west of Drakesbad Meadow (Patterson, 2005). These normal faults are not considered active or capable of generating a large earthquake.

Soils

Soils within Lassen Volcanic National Park are rocky, shallow, acidic, and originate almost exclusively from volcanic parent rock (NPS, 2002). Soil depths vary from several feet in the valleys to thin veneer at higher elevations. In the Warner Valley area, the middle Drakesbad Meadow consists of a complex relationship between organic-rich soils on an alluvial fan and mineral soils on an active floodplain where flood scour and fill processes dominate (AGE, 2004). Organic-rich soils are located across the northern half of the middle Drakesbad Meadow. The organic soils are predominately peat loams to mucky loams.

¹ A Normal fault is a fault with vertical movement and an inclined fault plane, where the block above the fault has moved down relative to the footwall.

Soil resources can be adversely affected by compaction by foot, livestock, or vehicular traffic. Compaction alters the structure of the soil, reduces its infiltration capacity, and results in erosion by accelerating runoff. Soil loss occurs by wind and water in soils that are exposed and not vegetated. Soil loss from slopes can be considerable when the snowpack melts after heavy rain or snow events. Degradation of soil resources through compaction and loss is a common geologic impact, especially in areas of heavy human use.

Seismicity

While there are geologic faults located in and around Warner Valley, these faults are not considered active. Ground motion hazard data provided by the U.S. Geologic Survey (USGS) indicates that the peak ground acceleration (PGA) in Warner Valley with a 10% probability of being exceeded in 50 years (1 in 475 chance of occurring in one year) is 0.22 g². This information suggests that the site is not likely to experience severe ground motions such as those that are expected to occur in high risk seismic areas such as the San Francisco Bay Area or the Los Angeles region. For comparison, those regions are located in areas of high seismic risk have PGAs that typically range from 0.4 to 0.6 g, while the Drakesbad Meadow site has an expected PGA of 0.22 g (WJE, 2003).

Earthquakes generally precede a volcanic eruption and for this reason they are monitored by the United States Geologic Survey's Volcanic Hazard Program. Nine seismometers located in and near the park provide a continuous record of seismic activity. This activity is monitored 24-hours a day by scientists from the U.S. Geological Survey's Earthquake Laboratory in Menlo Park, California. Primary purposes of this monitoring are to 1) provide early warning of a forthcoming volcanic eruption and 2) learn more about earthquake and volcanic phenomena based on "background" levels of seismicity. Evaluation of data from this network by U.S. Geological Survey scientists enables park staff to prepare an effective warning and evacuation plan in the event of renewed volcanic activity in the Lassen area (NPS, 1999).

Geologic/Seismic Hazard

Given that there is a low potential for a large earthquake in the project area and considering the soils types and presence of volcanic bedrock, it follows that the potential for seismically-induced ground failure is low. Furthermore, a low potential exists for non-seismic induced ground failure such as settlement, shallow subsidence, or gradual compaction of fine grain material to occur in the Warner Valley. The most susceptible area for gradual ground settlement or subsidence to occur is in areas of the meadow underlain by peat. Subsidence can also occur in localized areas where the reduction of water flow has depleted the peat layers through oxidation. Rockfall risk is present along the base of slopes, especially in areas of steep slopes with loose rocks. Although future volcanic eruptions in the vicinity of Lassen Volcanic National Park are likely, it is not possible at this time to predict where or when they will occur. The most likely locations are near Lassen Peak, Chaos Crags, Tumble Buttes or Bogard Buttes (NPS, 1999).

² Ground acceleration is expressed as a percent of acceleration due to gravity. g (gravity) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

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3.2 Hydrology and Water Quality

Introduction

One objective of the Warner Valley Comprehensive Site Plan (Plan) is to protect the unique natural resources found in the Warner Valley area, which includes preserving natural hydrology and protection of water quality. Hydrologic features include creeks, Drakesbad Meadow, sensitive wetlands, and the geothermal features located in the surrounding areas. This section outlines the hydrologic features of the Warner Valley area that would likely be affected by the efforts under the Plan to protect natural processes and cultural and wilderness resources. This section also presents available water quality information as a baseline to evaluate actions considered under the project alternatives. Sources accessed for this section include the *Warner Valley Comprehensive Restoration and Preservation Site Plan (2008)*, the *Hydrologic Characterization of a Mountain Fen Complex, Drakesbad Meadow, Lassen Volcanic National Park, Cascade Range, California (2005)*, and the *General Management Plan and Final Environmental Impact Statement, Lassen Volcanic National Park (2002)*.

Local Hydrology

Lassen Volcanic National Park contains over 200 lakes and ponds, 15 perennial streams, and portions of four drainage basins that flow to the Sacramento River (NPS, 2002). In Warner Valley, hydrology is controlled primarily by Hot Springs Creek, which flows along the southern margin of Drakesbad Meadow to eventually drain into the Upper North Fork of the Feather River. An unnamed tributary receives spring flow from the north side of Drakesbad Meadow then flows south to join Hot Springs Creek. The local hydrologic regime is snowmelt driven with precipitation beginning in October and averaging approximately 31 inches per year, 90 percent of which falls as snow (Patterson, 2005). A 100-year floodplain map has not been developed for Warner Valley within park boundaries. The only developed areas affected by flooding in the past have been the pool and bath house at Drakesbad Guest Ranch where only minor stream bank erosion and some overtopping occurred. However, the Warner Valley area is susceptible to localized flooding caused by rain-on-snow events, as occurred in 1938 and 1952 (Johnson, 2005). Precipitation averages about one half an inch per month during the June to August growing season.

Drakesbad Meadow and Fen

Drakesbad Meadow is the largest non-forested feature in Warner Valley and the largest meadow in the park (NPS, 2008). Contained within Drakesbad Meadow are areas of peat soils and saturated conditions characteristic of a wetland feature known as a fen. The fen at Drakesbad Meadow is about 4,000 years old.

Volcanic rocks north of Drakesbad Meadow make up a large groundwater aquifer that provides a consistent supply of water to the fen. Groundwater is discharged from the aquifer through springs in the bedrock slopes about 200 feet above the floor of Drakesbad Meadow and enters the meadow predominantly via surface flow paths with minor contributions from shallow

groundwater flow (Patterson, 2005). More than 99 percent of the water supply to Drakesbad Meadow originates as hillslope spring discharge during the summer; in the summer of 2002, the water table in many areas of Drakesbad Meadow remained at 2 inches from the soil surface despite almost no precipitation (Patterson, 2005).

The hydrologic regime of the fen and Drakesbad Meadow is considered a groundwater recharge area, or flow-through system, because the inability of the underlying mineral layers to transmit water vertically downward promotes horizontal flow south toward Hot Springs Creek. The lateral flow helps to maintain near surface water tables (Patterson, 2005).

Because water is recharged to the fen and Drakesbad Meadow predominately by surface flow from the upland springs, alterations to the surface water flow paths can have deleterious effects (Patterson, 2005). Records indicate that the meadow was modified in the early 1900s with hand constructed drainage ditches to drain and irrigate Drakesbad Meadow for livestock grazing. More recently roads, infrastructure, trails and a trailhead day use parking area have infringed upon the wetland area, adversely affecting the natural hydrologic regime and processes.

Dream Lake Dam

Dream Lake is a man-made feature, which is used by Drakesbad Guest Ranch guests for fishing, bird watching and canoeing. The dam at Dream Lake retains about 2.7 surface acres of water to a depth of about 5 feet and releases overflow through a spillway that feeds Hot Springs Creek downstream of the dam. There is no operational low-level outlet pipe. The dam was originally constructed in 1932 and was reconstructed after high winter runoff damaged the structure in 1938 and 1952. The dam retains water from four small, spring-fed tributaries which originally flowed into Hot Springs Creek from the uplands to the south. Beavers have constructed dams at the spillway, impeding spillway flow and causing overtopping at low points in the crest of the dam (NPS, 2008). The overall lack of maintenance at the dam and beaver activity has left the dam in a weakened state with a risk of failure (NPS, 2008). A Condition Survey Report completed in November 2000 to evaluate the downstream hazard classification of Dream Lake Dam reported that, although the dam had numerous deficiencies, the dam was a low-hazard potential structure due to its small size. No loss of life is expected to occur downstream if the dam were to fail (Graham, 2000).

Water Quality

Water quality is generally considered to be excellent because Lassen Volcanic National Park is located at high elevations and there is no development upstream to impact water within the park (NPS, 1999). Surface water from Drakesbad Springs and Warner Valley Springs is treated to provide drinking water for park visitors and staff. Drinking water is monitored daily by the National Park Service to assure a safe supply for human use. The Park also conducts periodic water sampling where sewage systems or human use could contaminate or otherwise alter the water quality.

Broad based chemical analysis and testing for herbicides and pesticides has been conducted in Forest Creek, the North Fork of Hat Creek, Lost Creek, Manzanita Creek and Flatiron Ridge Spring watersheds over the last twelve years. No pesticides have ever been detected in any of the park's watersheds (NPS, 1999). Water sampling for metals and general chemistry was conducted in 1995 at the "Northwest Spring" in Drakesbad Meadow. Water samples contained low to non-detectable metals concentrations and were indicative of an unimpacted groundwater source. All of the park's drinking water (before treatment) is neutral in reaction with a pH of about 7 with the exception of Forest Creek which is very acidic (pH of about 4.0) and also has high levels of aluminum and manganese. Results of all water testing have fallen within the State of California maximum contaminated levels for drinking water.

San Jose State University completed sanitary surveys on five park watersheds in 1997. The surveys recorded temperature, pH, turbidity, dissolved oxygen, and flow rates and sampled for the presence of coliform, giardia, and cryptosporidium. The park plans to complete sanitary surveys every five years to evaluate the impact of visitation on natural water quality and to assess water quality at water intakes at each watershed. The proposed monitoring program will evaluate water quality changes over time as they relate to changes in activities and management practices throughout the watersheds (NPS, 2002).

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3.3 Vegetation and Wildlife, Wetlands and Special-status Species

Introduction

Lassen Volcanic National Park is located near the junction of the Cascade and Sierra Nevada mountain ranges, and between the California and Great basin floristic provinces. The park is dominated by four major plant communities: yellow pine forest, red fir forest, subalpine forest, and alpine fell fields. Its geographic location, combined with a diversity of geologic substrates, results in a diverse flora as well as a correspondingly diverse wildlife assemblage.

Plant communities within the Park have been altered significantly by human activities, including livestock grazing, recreational use, and fire suppression. As noted in the Park's General Management Plan (NPS, 2002), in heavily impacted parts of the park, natural vegetation cannot re-establish on its own and restoration and enhancement programs must be implemented to restore these damaged areas.

Information presented below specific to the biological resources of Warner Valley is drawn from descriptions and data provided by the National Park Service (NPS), other NPS planning documents for Lassen Volcanic National Park and the Warner Valley area, and from reconnaissance level surveys of the project area conducted by ESA in 2005.

Vegetation

Vegetation of the Warner Valley area is adequately described in the Comprehensive Site Plan Final Report (NPS, 2008a) and will only be summarized here, with an emphasis on existing conditions within the project area. See also **Figure 3.3-1**, Warner Valley vegetation.

Vegetation along the Warner Valley Road from the ranger station to Drakesbad Guest Ranch, in and around the existing campgrounds and Drakesbad Guest Ranch, and along the trail to and surrounding Dream Lake is dominated by a variety of upland conifer forest types. Mixed conifer (or yellow pine forest (NPS, 2008a) is the most common, and is composed of white fir, Jeffrey pine, lodgepole pine, incense cedar, sugar pine, occasional red fir, and western white pine. Long-term fire suppression has led to substantial changes from the historical condition in forest composition and structure throughout the Park and within the project area. Forest stands have a higher tree density, show increases in shade tolerant and fire intolerant species such as white fir, exhibit increased amounts of dead wood on the ground, and have fewer openings in the forest canopy. These changes have resulted in decreases in forest understory cover and diversity. Recreational use in and around the campgrounds and Drakesbad Guest Ranch and along trails have compounded the problem in heavily used areas. Aspen groves in Warner Valley were remapped in 2005, but do not occur within the project area. Riparian and wetland vegetation are discussed in the section below.



SOURCE: National Park Service, 2005; National Wetlands Inventory, 2006

Warner Valley Restoration and Preservation
Figure 3.3-1
 Warner Valley Vegetation

Wetlands

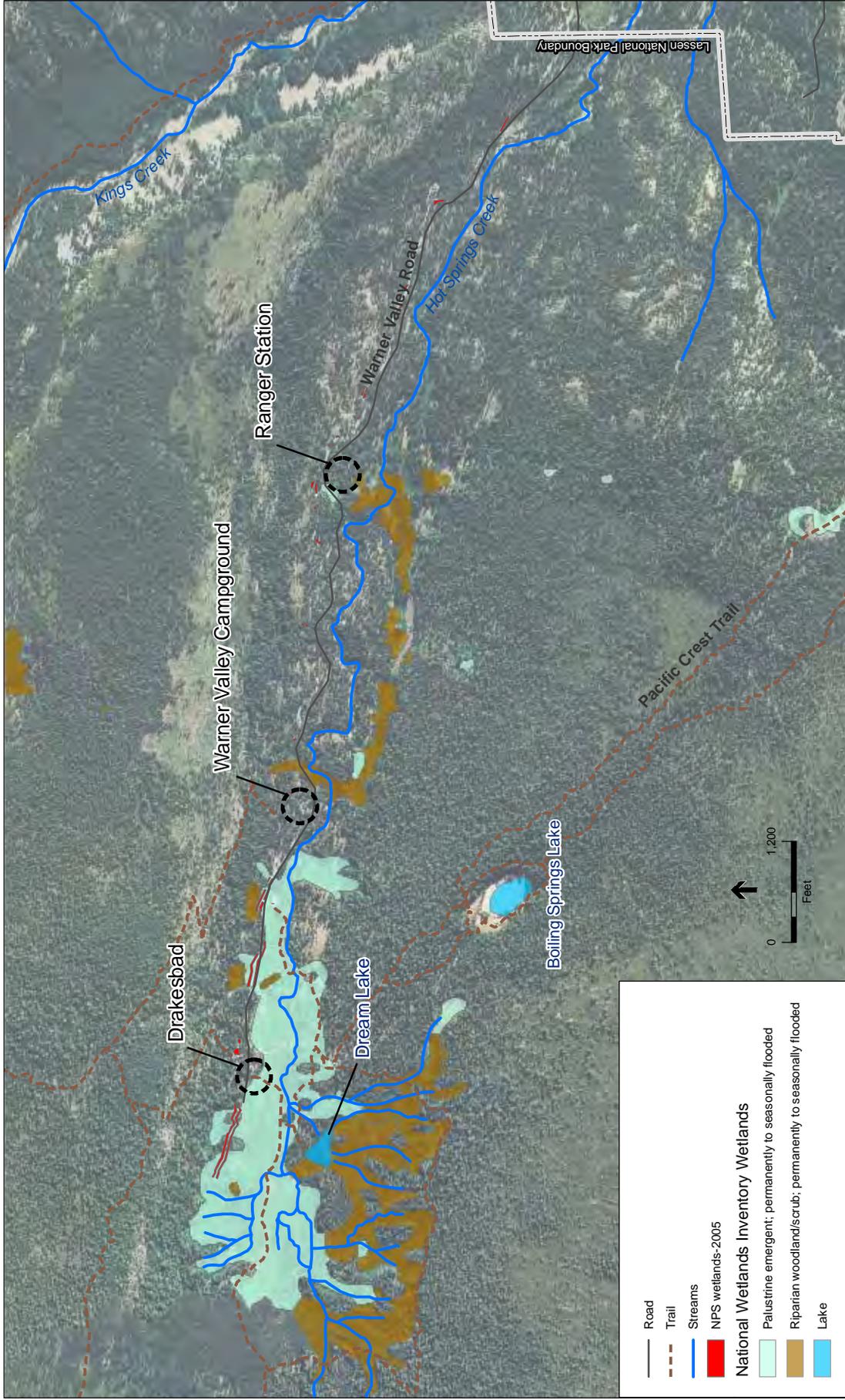
Wet Meadow, Riparian and other Wetland Areas

Wetlands, which support a high diversity of plant and wildlife species, are a critical resource in Lassen Volcanic National Park. National Wetlands Inventory (NWI) maps were produced in 1989 for the Park and surrounding National Forest lands and these maps were ground-truthed for accuracy within the project area in 2005 (Johnson, 2005). Based on several rough estimates for vegetation types, wet meadow and riparian/alder zones total over 2,000 acres in the park. Of this acreage, several wet meadow wetland complexes are significant in size, including Drakesbad Meadow, Kings Creek Meadow and Dersch Meadows. There are hundreds of smaller wetlands throughout the park associated with lakes, ponds, and streams.

Wet meadow, riparian and other wetland areas make up at least 15 percent of Warner Valley habitat. As vegetation types these areas are well described in the Comprehensive Site Plan (NPS, 2008a). See **Figure 3.3-2**, Warner Valley Streams and Wetlands.

Portions of Drakesbad Meadow in Warner Valley were identified as a fen (Patterson, 2005). At approximately 35 acres, this spring-fed complex is the largest wetland in the Park. Fens occur throughout the Rocky Mountains but few occur in the Cascade or Sierra Nevada mountain ranges. The entire Drakesbad Meadow complex is considered a palustrine (freshwater not associated with lakes, but rather with persistent groundwater), permanent to persistent emergent wetland (dominated by an array of grass-like plants and true grasses). Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and some saltwater wetlands. Palustrine wetlands include those areas called marshes, bogs, fens, and prairies as well as shallow permanent or intermittent ponds. Palustrine wetlands are further classified as forested, emergent wetland persistent, or scrub-shrub wetlands (Cowardin et al. 1979). Drakesbad Meadow, surrounding meadows along Hot Springs Creek, and the hillslopes above the valley floor comprise a mosaic of sedge-dominated wet meadows and scrub-shrub wetlands. Included are the seeps and associated wetlands along the south facing slopes above Warner Valley Road and along the water tank access road to the west of Drakesbad Guest Ranch. The scrub-shrub palustrine emergent wetlands are dominated by alder and willow, with an understory of grasses, sedges and rushes. Scrub-shrub wetlands generally contain an overstory of trees (approximately 20%) and an understory of shrubs (60%) with the trees usually less than 20 feet tall (Cowardin et al. 1979). The 1989 NWI mapping classified most of the palustrine meadows and scrub-shrub wetlands in Warner Valley as “seasonally flooded”, however, according to NPS staff, these are more accurately described as “permanently/persistently flooded” given the extensive spring systems feeding the hillslopes and valley floor (Johnson, 2005).

Meadow and fen hydrology was altered by the construction of ditches to de-water portions of the meadow in the early 1900s: construction of several roads and trails crossing the meadow (built on fill), and construction of the pool and bath house. The water tank access road was also built in such a way as to interrupt flow from a number of springs and seeps that constitute the primary hydrologic input to the fen. A recent study (Patterson, 2005) illustrated the effects hydrologic modifications were having on meadow vegetation and hydrology and made suggestions as to how



Warner Valley Restoration and Preservation
Figure 3.3-2
Warner Valley Streams and Wetlands

SOURCE: National Park Service, 2005; U.S. Fish and Wildlife Service, 2008

to restore fen hydrology. Culverts have since been installed along the water tank road and further restoration efforts are proposed as a part of the Comprehensive Site Plan.

Hot Springs Creek is the largest creek in the valley, running through Drakesbad Meadow and then paralleling Warner Valley Road through coniferous forest. Hot Springs Creek is considered an upper perennial riverine wetland, with mostly unconsolidated shore, some bedrock substrate, and seasonally flooded margins. There are numerous pockets of palustrine scrub-shrub seasonally flooded wetlands along the creek as it flows through Warner Valley. According to the Warner Valley Road Culvert Inventory (Appendix A), there are 21 smaller, intermittent tributaries to Hot Springs Creek that are culverted under Warner Valley Road from the park entrance to Drakesbad Guest Ranch. Some of these streams support pockets of emergent and/or scrub-shrub palustrine wetlands and others do not. Many of the culverts along Warner Valley Road are undersized and this has resulted in erosion of stream bed and banks downstream and/or upstream of the culverts.

Dream Lake, is a permanently flooded palustrine wetland and is a man-made impoundment fed by several drainages that carry flow from a series of seeps, as well as by rainfall and snowmelt. There are small emergent perennially to seasonally flooded emergent wetland areas located intermittently around the lake margins. Dream Lake Dam has failed twice in the past and is determined to be at risk of future failure, although the consequences are not expected to be catastrophic (Young, 2000; Zeigenbein and Smillie, 2002). There are many slumps, and seeps on the dam face and beaver activity blocking the spillway caused water to overtop the dam in 2003. The installation of “beaver deceivers” has since alleviated this problem.

Wildlife

Over 280 native wildlife species have been documented in Lassen Volcanic National Park, including 57 mammal species, 215 bird species, and 15 species of amphibians and reptiles (NPS, 2008b). However, little is known about the abundance and distribution of most species within the Park.

Wildlife inhabiting the Warner Valley was described in the Cultural Landscape Report for Drakesbad Guest Ranch (NPS, 2005) and ongoing songbird monitoring has been conducted annually in Drakesbad Meadow since 1997 (NPS, 2005). In addition, the recently produced *Weed Management Plan and Environmental Assessment* (NPS, 2008b) provides up to date information on biological resources in the Park. Information presented in these documents is summarized below.

Warner Valley is a mosaic of upland forest, wetland, wet meadow, and alder and willow riparian habitats, providing forage and cover for a diversity of wildlife species. Drakesbad Meadow is home to mammals such as the mountain pocket gopher, broad-footed mole, deer mouse, montane vole, and several different species of shrew. Black-tailed deer and coyote forage in the meadow and also use the surrounding forest, which also supports Douglas’ squirrels, golden-mantled ground squirrels, and several different species of chipmunk. Bobcats and mountain lions, although rarely seen, are also likely to be in the Warner Valley area. Black bears are quite common and can be seen in both the meadow and the forest. They have also been known to

frequent Drakesbad Guest Ranch, the Campground and the Ranger Station searching for food. Beavers occur along Hot Springs Creek and in Dream Lake where they have constructed dams. It is unclear whether this species was historically native to the Lassen area and, since they have the capacity to locally alter hydrology and vegetation, NPS commissioned several studies (Fellers, 1981; Beier, 1998) to provide a basis for beaver management within the Park and has since made the decision to manage the beaver as a native species. The pine marten is a large member of the weasel family that frequents the more mature forests around the Warner Valley area.

Many of the birds found in the Warner Valley are neotropical migrants that use the willows and alders along Hot Springs Creek and the edge of Drakesbad Meadow as breeding habitat. Of the 45 species documented in mist-net captures from 1997 to 2004 (NPS, 2005), some of the most common are song sparrow, Wilson's warbler, MacGillivray's warbler, Lincoln's sparrow, warbling vireo, orange crowned warbler, Cassin's finch, and yellow warbler. These surveys have also shown Warner Valley to be an important dispersal area for juvenile orange-crowned warblers and rufous hummingbirds, two bird species in decline, even though these species do not breed there. Common snipe and killdeer have been seen in Drakesbad meadow and spotted sandpipers nest along Hot Springs Creek and can be seen foraging at Dream Lake. Nearby lakes provide habitat for breeding mallards and bufflehead ducks.

Western tanagers, Hammond's flycatcher, dusky flycatcher, olive-sided flycatcher, evening grosbeaks, golden-crowned kinglets, brown creepers, and mountain chickadees, as well as Steller's jays, white-headed woodpeckers, pileated woodpeckers, hairy woodpeckers, downy woodpeckers, and red-breasted sapsuckers can be found in the forests surrounding Drakesbad Meadow. Birds of prey that are known to hunt and nest in the Warner Valley area include red-tailed hawks, northern goshawks, Cooper's hawks, and sharp-shinned hawks. Bald eagle and golden eagle occur only as flythrough species.

Aquatic species have not been well studied in the Warner Valley area. Eastern brook trout are known from Dream Lake and Hot Springs Creek and there has been a single sighting of Pacific lamprey in Hot Springs Creek (NPS WOD).

Special-status Species

There are a number of special-status species with potential to occur in the Warner Valley Comprehensive Site Planning area. Appendix B of this EIS provides comprehensive lists of the special-status species that have been documented from, or have potential to occur in suitable habitat within, the general project area (the Reading Mountain and Mt. Harkness 7.5 Minute USGS topographic quadrangles). These lists were obtained from the California Natural Diversity Database (CDFG, 2008), California Native Plant Society Electronic Inventory (CNPS, 2008), and the U.S. Fish and Wildlife Service (USFWS, 2008). Based on review of the biological literature of the region, previous environmental documents, surveys in the project site vicinity, and an evaluation of the habitat conditions of the proposed project site, many of these species were eliminated from further evaluation because (1) the project site or the immediate area does not provide suitable habitat, or (2) the known range for a particular species is outside of the project site and/or the immediate area.

The special-status species list presented in Table B-1 of the Appendix includes species for which potential habitat (i.e., general habitat types) occurs on or in the vicinity of the project sites. Species for which generally suitable habitat occurs but that were nonetheless determined to have low potential to occur in the project area are also listed in Table B-1. This table also provides the rationale for each potential-to-occur determination. There are 37 species (15 animals and 22 plants) observed, or with a moderate to high potential to occur, in the project area and these are discussed in further detail below.

Federally Listed Species

None.

State Listed Species

Sierra Nevada red fox generally occurs above 5,000 feet in forest and fell fields with wet meadows, but may also visit lower elevation areas in summer. There are currently no known den sites within the Park. Since most sightings have been in developed areas along the main park road within Lassen Volcanic National Park and the species is known to beg at parking areas and campgrounds throughout the Park, there is potential for this species to occur within the project area.

Greater sandhill crane can be found in wetland habitats such as meadows, pastures, grain fields, bogs, fens, marshes and fields. There have been sightings throughout Lassen Volcanic National Park, including Warner Valley, although no reproduction within the Park has been confirmed. A breeding pair is documented from Willow Lake southwest of the project area.

Little willow flycatcher nest in dense willow thickets in montane meadows and along streams. Records indicate this species historically bred in Sulphur Creek Meadows and around Snag Lake in Lassen Volcanic National Park. This species is currently found in the Warner Valley area, where breeding pairs were documented in 2004 (NPS, 2005).

California Species of Concern and Species of Park Concern

Animals

Northern goshawk is a secretive species found in mature or old growth coniferous forests within the park. Park staff has confirmed that this species nests in the park (NPS, 2008b) in similar habitat as the project area in areas less than five miles distant. This species may, however be unlikely to use habitat within the project area due to relatively high levels of human activity.

American dipper requires clear fast-moving water. It is confined to clear, clean streams and rivers with rocky shores and bottoms in mountains. This species has been documented as occurring in the project vicinity during annual mist netting efforts in Drakesbad Meadow and likely uses habitat in and along Hot Springs Creek for foraging and nesting.

Vaux's swift forages for insects over rivers and lakes and requires hollow trees and snags for nesting and roosting. The species has been documented in Lassen Volcanic National Park and there is suitable habitat present within the project area.

Yellow warblers nest in shrubby riparian thickets associated with streams and wetlands. Young of the year, as well as adults have been caught during annual mist-net efforts at Drakesbad Meadow, suggesting that the species breeds in the area.

Rufous hummingbird does not breed in Lassen Volcanic National Park but are found in the Park during spring and fall migration. Relatively large numbers of dispersing juveniles have been documented using riparian habitat in Drakesbad Meadow (NPS, 2005).

California spotted owl is associated with multi-storied coniferous forests with greater than 70% canopy cover. Trees larger than 30 inches in diameter are used for nesting. There are currently two known nesting pairs in Lassen Volcanic National Park. A non-breeding pair nested in Warner Valley in 2005. NPS staff surveys Warner Valley each summer but have not observed California Spotted Owls since 2005 (NPS, 2008b).

Five bat species are identified by the California Natural Diversity Database (CNDDDB) as having potential to occur within the general project area – silver-haired bat, hoary bat, fringed myotis, long-legged myotis, and Yuma myotis. The first two of these species may only occur as transients but have been collected in and around Lassen Volcanic National Park in June and July (CNDDDB, 2008), suggesting that they may breed in the area. The myotis species are most likely to occur and breed within the project area. These bats roost in conifers beneath loose bark or in cavities and may form maternity colonies in old growth trees or snags with large cavities. Other landscape features associated especially with hibernacula and maternity colonies (such as significant lava tubes, caves, and abandoned mines) are largely absent from the park (NPS, 2008b). Cliffs and rocky slopes also provide potential bat habitat. The mosaic of large, open Drakesbad Meadow, providing a ready source of insects, and surrounding conifers may provide optimal habitat for myotis bats in particular.

Sierra Nevada snowshoe hare is known to inhabit Lassen Volcanic National Park (NPS, 2008b). This hare is common in the Sierras but is seldom seen. Preferred habitat includes dense thickets of alder and willow associated with streams and the species may occur in and around Drakesbad Meadow.

Plants

There are 18 plant species listed by the California Native Plant Society found within the vicinity of Warner Valley. None of these species are currently listed by CDFG or USFWS but they are all being tracked by the CNDDDB. CNPS lists species because they are rare, endemic, or declining in all or part of their range. On this basis NPS considers these species to be of special concern. Two of these special-status plants are found only at high elevations in subalpine to alpine habitat and would not occur within the project area. The remaining 16 species are plants of creekbanks, seeps, wet meadows, bogs, and fens. Although none have been documented within the project

area, their presence cannot be ruled out, in Drakesbad Meadow, around the shores of Dream Lake, in the seeps along the water tank access road, or in the other small wetlands or numerous creeks that occur locally. Refer to Table B-1 in Appendix B for the names, habitat preferences, and potential to occur within the project area for each of these plant species.

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3.4 Soundscapes

Noise-Sensitive Uses

Sound levels are the audible intensities of air pressure vibrations, and are most often measured with the logarithmic decibel (dB) scale. To consider the human response to the pitch and loudness of a given sound in the context of environmental noise, the A-weighted frequency dependent scale (dBA) is usually employed. The equivalent energy indicator, Leq, is an average of noise over a stated time period, usually one-hour. The day-night average, Ldn, is a 24-hour average, which accounts for the greater sensitivity of most people to nighttime noise. Generally, a 3 dB difference at any time is noticeable to most people and a difference of 10 dB is perceived as a doubling of loudness.

Certain types of land uses are considered to be more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure time and intensity) and the types of activities typically involved with these land uses. Schools, libraries, churches, hospitals, convalescent and nursing homes, auditoriums, parks, and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Residences may also be considered noise-sensitive uses because residents may be disturbed by noise. Land uses within the project area are a combination of recreational and open space. There is also some road traffic in and out of the project area.

Natural Soundscapes

In a park setting, a natural soundscape is an area characterized by certain ambient acoustical and sound level qualities, absent the intrusion of sounds caused by humans or human technology. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials (NPS, 2006).

The natural soundscape is a component of any park setting that is intended to be managed or appreciated as natural, such as wilderness areas. The natural soundscape is viewed as a resource, as having value for its presence, and as a value to be appreciated by visitors. Many park visitors have an expectation of seeing, hearing and experiencing phenomena associated with a specific natural environment. The sounds made by wind, birds, geysers, elk, wolves, waterfalls, and many other natural phenomena are associated by visitors with unique features and resources of parks (Rogers, 2000).

Intrusive sounds are also a matter of concern to park visitors. As was reported to the U.S. Congress in the "Report on the Effects of Aircraft Overflights on the National Park System," a system-wide survey of park visitors revealed that nearly as many visitors come to national parks to enjoy the natural soundscape (91 percent) as come to view the scenery (93 percent). Noise can also distract visitors from the resources and purposes of cultural areas--the tranquility of historic settings and the

solemnity of memorials, battlefields, prehistoric ruins, and sacred sites (NPS, 2000). There are no air tour permits issued for the park and the park does not intend to approve any air tour permits over the park.

Many animal species are sensitive to increase sound levels and it is assumed this sensitivity contributes to decreased wildlife in developed areas.

Existing Noise Sources

Background noise in the park is generally much lower than that expected or tolerated in developed areas in which federal noise guidelines are generally applied. In the times that Warner Valley is closed to visitors, the ambient noise in the environment is primarily influenced by natural soundscapes. Park operations generate noise intermittently from personnel, vehicles, generators, hand tools such as hammers and power saws, heavy equipment such as backhoes and tractors, and smaller power equipment such as chain saws and weed eaters. Noise from park operations above ambient levels is confined to daylight hours (NPS, 2004; NPS, 2005).

During the peak tourism season, noise can be attributed to motor vehicles travelling along the parks access roads and to human use of recreational facilities. These include Drakesbad Guest Ranch, multiple picnic sites, and various restroom facilities. Noise associated with park maintenance also increases during peak season as a result of increased use. Additionally, occasional aircraft overflights also contribute to the ambient noise environment.

Regulatory Requirements

National Park Service 2006 Policies

The 2006 National Park Service Management Policies delineate its Soundscape Management Policies. These policies are designed in accordance with the Organic Act of 1916 and strive to manage National Parks in a way that will preserve them for the use of future generations. The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. Some natural sounds in the natural soundscape are also part of the biological or other physical resource components of the park. Examples of such natural sounds include:

- Sounds produced by birds, frogs, or katydids to define territories or aid in attracting mates;
- Sounds produced by bats or porpoises to locate prey or navigate;
- Sounds received by mice or deer to detect and avoid predators or other danger;
- Sounds produced by physical processes, such as wind in the trees, claps of thunder, or falling water.

NPS will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes.

The frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas. In and adjacent to parks, NPS will monitor human activities that generate noise that adversely affect park soundscapes, including noise caused by mechanical or electronic devices. NPS will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

Directors Order 47 – Soundscape Preservation and Noise Management

Directors Orders are one of several types of written guidances created for the proper management of national parks. The key directive from Director's Order 47 is that where natural soundscape conditions are currently not impacted by inappropriate noise sources, the objective must be to maintain those conditions. Where the soundscape is found to be degraded, the objective is to facilitate and promote progress toward the restoration of the natural soundscape. There are eleven instructions and requirements outlined in Director's Order 47. They are listed below and incorporated into the discussion of environmental consequence if applicable.

1. Applicable Policies
2. Reference Manual
3. Soundscape Preservation and Noise Management Planning
4. Interim Noise Management Measures
5. Inventorying and Monitoring the Soundscape
6. Establishing Soundscape Preservation Objectives
7. Defining Impacts on Park Soundscapes
8. Constructive Engagement
9. Air Tour Management Planning
10. Interpreting the Soundscape to Visitors
11. National Program Steering Committee

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3.5 Cultural Resources

Introduction

Archaeological Resources

It is not definitively known when human habitation in California first began, though research has this event occurring sometime before 10,000 B.C. This first period of human occupation is commonly referred to as the *Paleo-Indian Period*, characterized by small groups of nomadic hunter gatherers faced with different ecologic-climatic environments than those familiar to modern-day Californians (Fagan, 2003). Recent scholarship proposes a date range for the Paleo-Indian Period as before 5000 calibrated B.C. (Jones & Klar, 2007). There is little evidence that Paleo-Indian populations hunted regularly at higher elevations, however some isolated Paleo-Indian fluted points have been found in northeastern California, as have several Paleo-Indian sites been discovered along Honey Lake (Chartkoff & Chartkoff, 1984; Jones & Klar, 2007: 169).

Following the Paleo-Indian Period is the *Post-Mazama Period*, dating from 5000 calibrated B.C. to 3000 calibrated B.C. (Jones & Klar, 2007). Post-Mazama cultural traits include “semi-subterranean house structures...morphologically distinctive artifacts” such as “large side-notched projectile points, antler wedges, mortars with V-shaped bowls and pointed pestles, T-shaped drills, tanged blades, and flaked stone pendants” (Jones & Klar, 2007: 170). After the Post-Mazama Period comes the *Archaic Period*, representing a continuation of earlier traditions along with an increase in population size and a change in subsistence strategy, as well as the development and implementation of new technologies (Chartkoff & Chartkoff, 1984). Dates for the Archaic Period as defined by Jones & Klar (2007) span between 3000 calibrated B.C. and calibrated A.D. 1400. Typical material culture types from the Archaic include, but are in no way limited to, an expanded flaked tool assemblage, the appearance of “U-shaped grinding bowls and flat or round-ended pestles”, and the “occupation of large semisedentary villages”, along with “elaborations in material culture, house construction, obsidian production, and ceremonial activity” (Jones & Klar, 2007: 171-174).

Several ethnographic Native American tribes were present within the Lassen area, among them the Atsugewi, Yana, Yahi, and Maidu. The Mountain Maidu tribe is most notably associated with the Warner Valley area (NPS, 2005). Lassen Peak had particular importance, as evidenced by its inclusion in local myths and Native lore (NPS, 2002). The respective territories for these groups converged on Lassen Peak with the Atsugewi spreading from the mountain to the north and east, the Yana to the west, the Yahi to the south, and the Maidu to the south-southeast (Kroeber, 1925; Jones & Klar, 2007). Hunting, fishing, and gathering were essential to the subsistence strategy for these groups. Access to seed resources such as acorns was limited and therefore of less importance to the overall strategy employed by these populations (Jones & Klar, 2007). Like most of the mountainous regions of California, the Lassen area was not conducive to year-round living (Chartkoff & Chartkoff, 1984). Contained within the Lassen Volcanic National Park are numerous cultural resources that collectively represent nearly 4,000 years of human habitation. Specific cultural resources include a large village, lithic workshops, and several seasonal

campsites (NPS, 2002). As of 2009, nine percent of the Park had been surveyed and approximately 106 archaeological sites have been recorded (Svinarich, personal communication, 2009).

The first known person of European descent to settle in Warner Valley was Edward R. Drake (1830-1904), at the location which would later be known as the Drakesbad Guest Ranch area; it is possible that Drake arrived as early as 1875 (NPS, 2004a). In the 1880s, records show that Drake purchased a land claim to property in Hot Springs Valley and over the next decade, he successfully acquired additional property. By 1900 Drake's land holdings totaled 400 acres and included many hot springs and other thermal features associated with the Mount Lassen volcano (NPS, 2007a). It was also in the early years of the 20th Century that Alex Sifford first came to what was called Drake's Place. A. Sifford purchased acreage from Drake thus beginning the further development of Drake's Place as a tourist operation, hence the name "Drakesbad" (NPS, 2004b). In 1916 Lassen Volcanic National Park was established for public recreation and "for the preservation from injury or spoliation of all timber, mineral depositions and natural curiosities or wonders" (NPS, 2003). Drakesbad and Warner Valley was officially purchased by the National Park Service in 1958, completely removing Sifford's ownership by the fall of 1959 (NPS, 2004b: Part 2b, page 3).

Archaeological investigations within Lassen Volcanic National Park have occurred since the 1950s (NPS, 2005; NPS, 2007c). In 2000, recent archaeological investigation was completed for the Drakesbad Guest Ranch area by the Archaeological Research Program, Department of Anthropology, California State University, Chico. Resulting from this investigation, 5,181.8 acres were surveyed utilizing a combined strategy of high-intensity and moderate-intensity reconnaissance survey strategies (White, 2001). The Archaeological Research Program team identified and recorded 33 isolated finds associated with the prehistory and history of the Drakesbad Guest Ranch area. Isolated finds occur most prevalently along Hot Springs Creek, beginning to the east of Devils Kitchen and continuing east towards the confluence of Hot Springs Creek and Kings Creek. In particular, two concentrations of prehistoric isolated finds are noticeable. One of these finds is immediately east of Devils Kitchen and the second immediately south-southeast of the Drakesbad Guest Ranch area (White, 2001: Figure 7.6). Along with isolated finds, 36 archaeological sites were studied by the Archaeological Research Program project, 20 of which represented revisited sites; the remaining 16 were newly discovered archaeological resources (White, 2001:55). All of the 36 sites contained a prehistoric component, while only five contained evidence of historical use or occupation in conjunction with the prehistoric component. Several of the archaeological resources investigated during the 2000 survey are generally located within the day use area, Warner Valley campground, or Drakesbad Guest Ranch locality (White, 2001).

Cultural Landscape

Detailed Cultural Landscape Inventory and Cultural Landscape Reports for the Drakesbad Guest Ranch have been completed (NPS 2004b, 2005). The Cultural Landscape Inventory report (NPS, 2004b) serves as the primary source for the following discussion of the Drakesbad Guest Ranch. Numerous other background studies have been completed for the Drakesbad Guest Ranch area, many of which are also referenced here.

The Drakesbad Guest Ranch represents a 440-acre historic vernacular landscape in Warner Valley, representing a period of significance from 1900 to 1952. Initially founded as “Drake’s Place” by Edward Drake in the late 19th Century, this property evolved into “Drake’s Hot Springs and Resort” for camping and tourism and eventually “Drakesbad.” Most early development by Drake emphasized improvements that would immediately meet Mr. Drake’s personal needs and interests. Drake, from the beginning, permitted the public access to the surrounding area and use of his property for camping and recreation (NPS, 2004b: Part 3a, page 9). The Drakesbad Guest Ranch cultural landscape includes the primary guest ranch building cluster, as well as several natural landscape elements that were core areas of use during the period of significance, among them being Devils Kitchen, Dream Lake Dam, Boiling Springs Lake, and Indian Rock. The primary guest ranch building cluster was used for accommodating guests and for keeping saddle horses, consisting of auxiliary structures around Drake’s “big house” which was specifically built as a hotel. Along side such manmade elements are several natural systems and man-modified natural features that influenced and encouraged “the establishment and development of the facilities, infrastructure, and defined the landscape character of” the Drakesbad Guest Ranch (NPS, 2004b: Part 3a, page 4), particularly Drakesbad Meadow and Dream Lake Dam.

Alex Sifford later arrived at Drakesbad, further contributing to the improvement of Drakesbad Guest Ranch. Improvements included the expansion of the primary building cluster, the enhancement of Drakesbad Meadow, road and trail improvements, and the construction of Dream Lake Dam. Among the trails attributed to A. Sifford and his son was the Head of the Valley Trail, Devils Kitchen Trail, High Trail above Devils Kitchen, and South Trail along Hot Springs Creek from the main campground towards the east park boundary (NPS, 2008: 43). The Boiling Springs Lake Trail is also an historic trail built by Sifford to link the 40-acre parcel he purchased from Edward Drake in 1901 with Drake’s core property. Circulation is considered to be a contributing landscape characteristic to the Drakesbad Guest Ranch (NPS, 2004b: Part 3b, page 3). To offer fishing and boating opportunities to visitors at Drakesbad Guest Ranch, R.D. Sifford “dammed a natural drainage in the hill slope above the south bank of Hot Springs Creek to form ‘Dream Lake’” (NPS, 2004b: Part 1, page 5). The earthen dam was originally constructed in 1932, followed by two reconstructions in 1938 and 1952. Dream Lake Dam is considered a contributing resource (structure) of the historic district (NPS, 2008: 42-43; NPS, 2004b: Part 3b, page 13).

In October 2003, the Drakesbad Guest Ranch was officially listed on the National Register of Historic Places as an historic district, identified as having significance at the state level according to Criterion A due to “its direct and significant association with regional conservation and with the development of the northern California tourism industry” (NPS, 2004b: Part 1, page 17). Of the extant buildings at Drakesbad Guest Ranch, 10 are from the historic period. The Drakesbad Lodge is listed in the National Register of Historic Places and 9 others are listed as contributing to the historic district, including the dining hall, food locker, bunkhouse, and six cabins (four cottages, Manager’s Cabin and Annex) (NPS, 2005). “The historic district boundary includes Edward Drake’s original cash entry and homestead claims and a non-contiguous forty-acre parcel purchased by Sifford from the state of California in 1901 which contains most of Boiling Springs Lake” (NPS, 2004b: Part 1, page 5).

The Warner Valley Ranger Station is an historic structure representing the first building constructed by the Park Service in 1926. It was subsequently damaged by heavy snow during that next winter and rebuilt in 1927 (NPS, 2007b). This structure is officially listed on the National Register of Historic Places in 1978 (NRHP, 2008).

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3.6 Visitor Experience

Introduction

One of the purposes of the Warner Valley Comprehensive Site Plan is to improve visitor experience through educational, interpretive, and recreational opportunities in the Park. Visitor use throughout the park is summarized in the *Commercial Services Plan and Environmental Assessment* published in 2005. This publication found the average number of park visits to be about 380,000 visits per year from 1995-2005. The park is open year-round, however access through the park on the main road is usually only available from June through October due to heavy snowfall. The four-month period between June and September typically accounts for nearly 80 percent of the annual visitation. Substantial drops in visitation can occur during years of early road closure and late spring road openings due to snow (NPS, 2005).

Visitor Use Levels

The majority of visitors to Lassen Volcanic National Park (Lassen) are touring the region. They spend about a half-day driving through the park and stopping at interpretive attractions. While it is not considered a destination park, approximately 25 percent of visitors stay overnight in the park. A much larger majority stay overnight outside the park in a nearby community (NPS, 2008). There are several campgrounds and commercial lodging at Drakesbad Guest Ranch. The park provides a total of 485 individual sites and 15 group campsites in nine campgrounds. Most group campsites are located at the Lost Creek, Butte Lake and Juniper Lake campgrounds. During Fiscal Year 2004, 13,159 visitor nights (number of campers multiplied by the number of nights stayed) were recorded at Manzanita Lake, which is the park's most heavily used campground (NPS, 2005). In the backcountry and wilderness an average of 7,600 overnight stays per year have occurred over the between 1995-2005. Visitation at Lassen is highly seasonal. While some use of the park occurs year around by cross-country skiers and snow shoers, significant visitation levels do not occur until the main road can be opened. July and August are the peak visitation months, accounting for nearly half of the annual visitation in 1999. The four month period June-September accounted for nearly 80 percent of the annual visitation for that year.

Drakesbad Guest Ranch

Drakesbad Guest Ranch provides rustic overnight accommodations and various recreation opportunities for its guests such as hiking, horseback riding, wildlife viewing, fishing, canoeing and swimming. Drakesbad Guest Ranch consistently operates at near full capacity during the summer season, averaging about 5,500 overnight stays per year during 1995-2005. The clientele at Drakesbad Guest Ranch tend to be repeat visitors that have been coming back generation after generation for many years (NPS, 2005). At the Drakesbad Guest Ranch guests stay for an average length of five days in the months of July and August and three days in June, September, and October. The average number of reservations made each year is usually around 800-900 (Johnson, 2005). There are 19 guest rooms with a capacity of approximately 70 guests per night. The number of guest rooms will remain the same under each alternative.

Warner Valley Campground

The Warner Valley Campground is open from June 5th-September 22nd, with water, then dry camping until October 13th, weather permitting. It is located one mile west of the Warner Valley Ranger Station via a dirt road. There are 18 campsites that accommodate up to three tents, with a limit of 6 people per site. Campground usage in 2004 and 2005 is shown in **Table 3.6-1**.

**TABLE 3.6-1
WARNER VALLEY CAMPGROUND USE IN 2004 AND 2005**

Month	# of Tents	# of RVs
2004		
June	153	10
July	175	27
August	121	15
September	65	3
October	16	2
2005		
June	72	32
July	157	32
August	245	37

SOURCE: Johnson, 2005

Driving

Warner Valley is a part of the “Remote Access Road Zone,” one of the eight management zones outlined in the General Management Plan. Management zone prescriptions provide the basis for a system of management intended to ensure that resources are passed on unimpaired to future generations and visitor experiences remain high quality.

Within the Remote Access Road Zone the driving experience give the visitor a sense of being in a largely undisturbed natural environment. Regularly maintained roads and directions signs are the only facilities present.

In 2005, traffic counts within the Warner Valley were measured on Warner Valley Road and totaled 920 in July and 1056 in August. In 2004 the following estimates were calculated: June: 898, July: 1294, August: 1480, September: 1522, October: 1209, and November: 13. See Section 3.8, Transportation for more information on this topic.

Visitor Experience

The park’s interpretive program provides visitors with opportunities to learn about park phenomena. The program includes handout materials, wayside exhibits, interpretive programs, and roving interpreters. A visitor study conducted in 1999 identified the most common activity for visitors to be scenic driving, followed in descending order by visiting geological/geothermal features, photography, hiking, picnicking, camping, visiting Loomis Museum, nature study,

attending ranger-led programs, fishing, and backpacking overnight. In this same study, when visitor groups were asked how much time they spent in Lassen Volcanic National Park, 58 percent spent less than one day in the park. Of the groups that spent less than a day at the park, 49 percent spent four hours or less, while 22 percent spent seven hours or more (Rogers, 2000).

Lighting

Very little artificial lighting occurs in Warner Valley, given that no commercial power is available beyond the town of Chester. The only lighting at the ranger station is from portable propane bottle lanterns. The campground has no lighting (other than camper's flashlights and lanterns) and the Drakesbad Guest Ranch has electric lighting in the dining hall, kitchen, and lodge, which are powered by the diesel generator (Johnson, 2005). See Section 3.9, Scenic Resources for more information on lighting.

References

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3.7 Public Health and Safety

Introduction

One of the purposes of the action to develop the Warner Valley Comprehensive Site Plan is to address safety concerns in Warner Valley; evaluate the appropriateness and adequacy of existing infrastructure with respect to visitor safety; and to protect public health and safety by addressing structural concerns of Dream Lake Dam, which impounds Dream Lake. The following existing conditions describe these areas of concerns for public health and safety.

Entry to Warner Valley

At the entry to Warner Valley, there is a lack of adequate room for parking and the fee station is located on a blind curve. The iron ranger (which is where fees are deposited when a ranger is not on duty) is located in a natural drainage way with soft soils, so braking and accelerating of cars causes excessive wear on the road. The location of the water tank road leads to confusion at the entrance and there is a blind curve one-half mile past the ranger station. Safety incidents within Warner Valley have resulted in a five-year average of 5-6 incidents per year. This number includes visitor injuries attributed to the park or environment, as well as illness and employee incidents that required emergency response.

Campground, Trail Use and Day Parking

Lower Campground

There are safety issues regarding the close proximity of the campsites to the creek and the road. A steep slope down from the campsites to the creek poses a hazard to visitors. Dust from cars on Warner Valley Road impact the visitors staying in the campground.

Upper Campground

The upper campground is located on the north side, above Warner Valley Road, and is the larger of the two campgrounds. It has the capacity to accommodate additional campsites. The parking area configuration degrades the adjacent vegetation. Dust produced by cars on Warner Valley Road is a concern in this campground as well.

Trail Use

The Pacific Crest Trail (PCT) at the north side of the upper campground is disconnected from the rest of the Warner Valley trail system and presents a hazardous situation for hikers where it connects for a stretch along Warner Valley Road towards Drakesbad Guest Ranch.

Concessioner Employee Housing

There are currently fifteen concessioner staff housed in a combination of temporary trailers, a dormitory above the dining hall and a space above the laundry called the “bunk house”. Concessioner housing is inadequate, there is a lack of adequate capacity for seasonal staff, potential fire hazards exist and construction is substandard.

Bathhouse and Pool

The bathhouse facilities are in a state of disrepair. There is a lack of adequate space, and facilities are not accessible to the physically disabled.

3.8 Transportation

Introduction

The Lassen Volcanic National Park 2002 General Management Plan states that among the purposes of the Warner Valley Comprehensive Site Plan are provisions for cost-effective solutions to address Warner Valley road safety concerns, and to improve circulation and parking. Issues addressed in this section are provision of visitor access while protecting cultural landscape, and historical and natural resources. Alternatives for transportation improvements to the visitor entry sequence, road improvements, and day use / trailhead parking will be evaluated in this section.

Vehicle Access

Regional access to the Warner Valley area is provided by State Highway 36, a two-lane road that connects Susanville on the east with Red Bluff on the west. Local access is provided via Chester on the Warner Valley Road, which connects with Feather River Road extending from the town of Chester; the road from Chester is an approximate 17-mile drive (the last three miles are of compacted gravel construction with a 20-foot width).

Vehicle Circulation

As vehicles enter the Park in Warner Valley, drivers first encounter the fee station (“iron ranger”¹). Currently, visitors have to stop their vehicles in the road, or park at the ranger station and walk back 100 feet to access the fee station. In addition, the fee station is located on a blind curve. Another feature of the area is a small gravel road leading to the water tank that supplies the Ranger’s station; this road creates confusion to visitors who mistake it for an access road. Approximately one-half mile past the ranger station, the road dips and then rises abruptly around a blind curve. Site circulation at Drakesbad Guest Ranch is rural in character, with rocks/logs defining the circulation patterns. Over time, the edge “creep” of parking areas and roads has created unclear zones for traffic.

Parking Areas

Located at the western edge of Drakesbad Meadow, the Day Use Parking Area consists of a gravel parking lot accommodating approximately 12 cars. At the Drakesbad Guest Ranch, there is a lack of defined parking spaces (with an approximate total of 70 spaces), with guests and staff currently parking vehicles wherever there is clear space to park.

¹ An iron ranger is a fee collection box used at campgrounds, day-use facilities, etc. when those sites do not have full-time attendants.

3.9 Scenic Resources

Introduction

The Organic Act of 1916 requires that the National Park Service promote and regulate the national parks "...by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The park resources and values that are subject to the no impairment standard include *"the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility both in daytime and at night..."*

Scenic resources are an essential component of Warner Valley's resources. The scenic resources are not only an indicator of the health of the park environment but also a large part of the visitor experience. The Warner Valley Visitors study, written in 1999 found that 96 percent of respondents felt that scenic views were a very or extremely important part of their experience. Additionally, 94 percent said that natural features were a very or extremely important part of their experience.

Critical Viewsheds

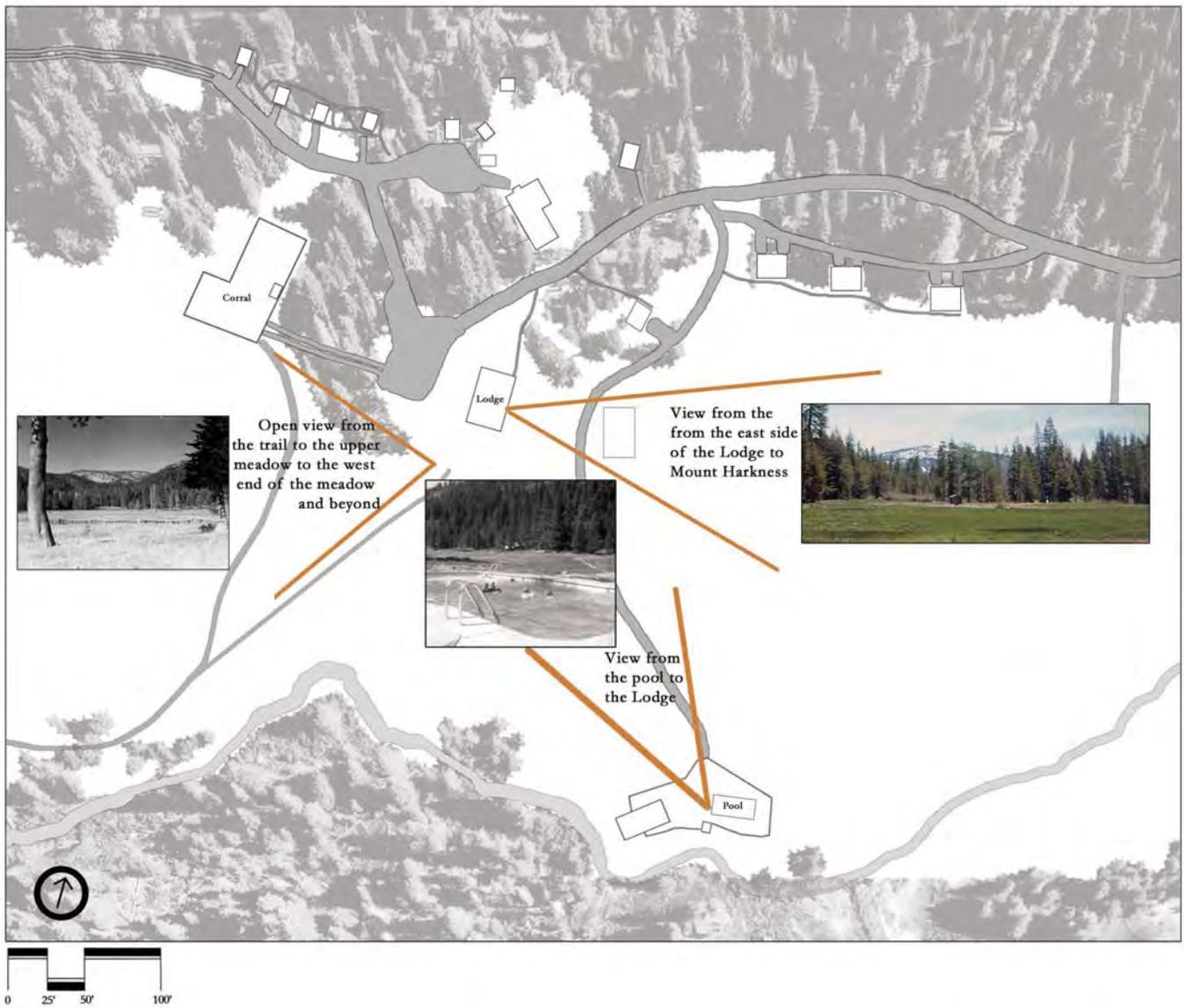
The 2005 Cultural Landscape Report for Drakesbad Guest Ranch identifies three critical and historic viewsheds for Warner Valley (see **Figure 3.9-1**): the view from the east side of the Drakesbad lodge to Mount Harkness, the view from the pool to the Drakesbad lodge, and the view from the trail to the upper meadow to the west end of the meadow. Existing scenic resources as seen from the three viewsheds will serve as base line conditions and changes to the viewshed that may result from the proposed project and its alternatives will be discussed.

Mount Harkness

Mount Harkness is located in the south east corner of Lassen Volcanic National Park and to the east of Warner Valley. The view from the east side of the lodge to Mount Harkness is one of the critical viewsheds.

Drakesbad Lodge

There are approximately 20 structures located at Drakesbad Guest Ranch. They are primarily clustered on a relatively narrow land bench above the meadow. Because of the historic nature of the buildings much of the surrounding vegetation is native. With few exceptions, ornamental vegetation (annuals and perennials, non-native shrubs and trees) was not used at Drakesbad Guest Ranch. However, some non-native and native vegetation exists today within the core area,



reflecting both historic and non-historic uses. Historic photos reveal expansive views from the pool to Drakesbad Lodge.

Drakesbad Meadow

The large open space of Drakesbad Meadow is a dominant cultural landscape feature of the historic district and one of the primary components of the viewsheds of Warner Valley. Part of the meadow is a fen while other parts are open grasslands and wetlands. In addition to being a valuable natural resource, the meadow provides long vistas to major park features. These vistas shall be maintained as part of the cultural landscape.

The 70 acres comprising the meadow were actively managed during the historic period. Management included various activities such as construction of ditches to drain and irrigate the meadow, active and cyclic removal of willow and alder thickets, and grazing livestock creating an open pastoral character. With the identification of additional resource values, the change in land use (removal of grazing) and vegetation management practices, the historic character of the meadow has begun to change and vegetation growth is obscuring the historic views. The view from the trail to the upper meadow to the west end of the meadow is one of the critical viewsheds.

Night Sky

Stargazing capabilities are one of the visual resources in Warner Valley. Artificial lighting can prevent or diminish stargazing capabilities. Very little artificial lighting occurs in Warner Valley, given that no commercial power is available beyond Chester. The only lighting at the ranger station is from portable propane bottle lanterns; the campground has no lighting (other than camper's flashlights); and Drakesbad Guest Ranch has electric lighting in the dining hall, kitchen and lodge (powered by the diesel generator) (Johnson, 2005). However, the view of the night sky remains relatively unobstructed.

Regulatory Requirements

National Park Service Management Policies 2006

Section 4.10 - Lightscape Management

The Service will preserve, to the greatest extent possible, the natural lightscapes of parks, which are natural resources and values that exist in the absence of human-caused light. The absence of light in areas such as caves and at the bottom of deep bodies of water influences biological processes and the evolution of species, such as the blind cave fish. The phosphorescence of waves on dark nights helps hatchling sea turtles orient to the ocean. The stars, planets, and earth's moon that are visible during clear nights influence humans and many other species of animals, such as birds that navigate by the stars or prey animals that reduce their activities during moonlit nights. Improper outdoor lighting can impede the view and visitor enjoyment of a natural dark night sky. Recognizing the roles that light and dark periods and darkness play in natural resource processes and the evolution of species, the Service will protect natural darkness and other components of the natural lightscape in parks. To prevent the loss of dark conditions and of natural night skies,

the Service will minimize light that emanates from park facilities, and also seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks. The Service will not use artificial lighting in areas where the presence of the artificial lighting will disrupt a park's dark-dependent natural resource components.

The Service will:

- restrict the use of artificial lighting in parks to those areas where security, basic human safety, and specific cultural resource requirements must be met;
- use minimal-impact lighting techniques;
- shield the use of artificial lighting where necessary to prevent the disruption of the night sky, natural cave processes, physiological processes of living organisms, and similar natural processes.

The decision about whether or not to install artificial lighting in particular circumstances is left to the discretion of the superintendent and is made through the planning process.

Section 9.1.3.1 - Construction Sites

Construction sites will be limited to the smallest feasible area. The selection of construction sites will consider opportunities for taking advantage of natural sources of lighting, heating, and cooling (e.g., near an existing or potential stand of deciduous trees) to maximize energy conservation. Ground disturbance and site management will be carefully controlled to prevent undue damage to vegetation, soils, and archeological resources and to minimize air, water, soil, and noise pollution. Protective fencing and barricades will be provided for safety and to preserve natural and cultural resources. Effective storm water management measures specific to the site will be implemented, and appropriate erosion and sedimentation control measures will be in place at all times. Solid, volatile, and hazardous wastes will be avoided when possible. When they cannot be avoided, they will be properly stored, transported, and disposed of in compliance with federal, state, and local laws and regulations. All materials will be recycled whenever possible.

A review and approval of any "hot work" (e.g., welding, use of open flame, grinding) will be done to ensure fire safety at the construction site. Visual intrusions will be kept to a minimum. Construction equipment will be in satisfactory condition; i.e., it will be equipped with required safety components and not be leaking hazardous liquids or emitting hazardous or undesirable fumes above allowable legal limits. Care will be exercised to ensure that construction equipment and all construction materials imported into the park are free of undesirable species. The cost of restoring areas impacted by construction will be considered part of the cost of construction, and funding for restoration will be included in construction budgets.

References

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3.10 Park Operations and Facilities

Introduction

The park operations and facilities at Warner Valley consist of the infrastructure and associated activities to protect and preserve vital resources and provide for an enjoyable visitor experience. Facilities support the following park functions: resource management, visitor protection, interpretation services, facility management, and concessions management. Visitor facilities include the Warner Valley campground, Drakesbad Guest Ranch and associated structures. Infrastructure facilities include buildings, historic structure, trails, roads, bridges, dams, signs, and utilities. Maintenance facilities include the propane tanks, water tanks, sheds and storage facilities.

Project Setting

Visitor Entry

Facilities at the entrance of Warner Valley include a fee station and iron ranger (i.e. receptacle for fees), ranger station (residence), barn, garage, vault toilet, and a pump house. A small gravel road next to the fee station leads to the water tank. See the Transportation section of this document for more information and environmental consequences.

Drakesbad Guest Ranch

The infrastructure associated with the Drakesbad Guest Ranch consists of 15 one- and two-story wood-framed buildings, and a one-story concrete masonry unit building. These buildings include the lodge, dining hall, bathhouse, four cabins, a manager's cabin, bunkhouse, generator shed, cook/storage shed, annex, and three duplex cabins. Drakesbad Guest Ranch is only operated during the summer and early fall (typically early June to mid October).

Dining Hall

The dining hall and adjacent area includes an outdoor dining patio with four tables that are adjacent to the dining hall. The gravel surface is not visually compatible with the natural and cultural landscape and is not Americans with Disabilities Act (ADA)-compliant.

Bathhouse and Pool

This area consists of a pool, filter house and bathhouse including a women's restroom, a men's restroom, two private bathtub areas, four private showers, four private changing stalls, massage room, and a storage/mechanical room.

Campground

The campground has 18 campsites, with five sites in the lower campground, and 13 sites in the upper campground. One of the sites serves as a campground host site. In addition to the cleared tent sites, there are picnic tables, grills, spigots for running water. The restrooms consist of vault toilets and there is no electric service.

Corral

The corral holds 20 horses with a capacity for a maximum of 24 in a space of 7500 square feet. In addition there is a small tack shed, hitch nails and parking area.

Volleyball Court

The 500 square foot sand court is currently located within sensitive meadow landscape.

Park Operations

Utilities

The National Park Service provides water and waste water for Warner Valley. There are two water tanks located in Warner Valley. One water tank, located near the ranger station, provides water for the ranger station; the other located at the western edge of Warner Valley provides water for the Drakesbad Guest Ranch. The concessionaire provides electricity and propane. The sewer line runs under the bridge and leads to leach fields in an open area above the creek. Other utility structures include a dumpster, propane tanks, site storage at the 'bone yard', generator, sewer line and overhead power lines at dining hall service area. Other structures associated with Warner Valley include water conveyance structures; a 40,000 gallon water storage tank; and sewage lift station located along Warner Valley access road.

Energy and Conservation Potential

One purpose of the action is to improve sustainability/efficiency of the operations and possibly considering solar power. The eastern edge of Drakesbad Meadow, an open area near the leach field is a possible location for photovoltaic arrays.

The 1999 Memorandum of Understanding between the Department of the Interior and the Department of Energy provides a framework to promote implementation and use of energy-efficient and renewable resource technologies. All new development and construction in the Warner Valley area would minimize energy consumption as practicable by designing energy efficient buildings and employing efficient building systems, equipment and appliances.

Parking

The day use parking area is a gravel lot with space for approximately 12 cars. Currently, the Pacific Crest Trail exits from the lot and crosses a bridge over Hot Springs Creek. There are approximately

70 parking spaces available within the Drakesbad Guest Ranch. See Section 3.8, Transportation of this document for more information and environmental consequences on parking and roads.

Employee Housing

The concessioner housing and service center include a dormitory above the dining hall which holds five employees and a small area above the laundry for the managers.

Walkways and Trails

A number of hiking trails cross through Warner Valley and lead from Drakesbad Guest Ranch to attractions such as Boiling Springs Lake and Devils Kitchen. In addition, the Pacific Crest Trail, a National Scenic Trail that runs 2,638 miles from Mexico to Canada, crosses through Lassen Volcanic National Park at Warner Valley. Throughout Drakesbad Guest Ranch a network of walking paths connect areas between features such as the pool and bathhouse and from the Drakesbad Guest Ranch to the corral.

CHAPTER 4

Environmental Consequences

This section of the Environmental Impact Statement (EIS) describes the potential impacts of each alternative on the topic areas relevant to the project. The topics analyzed in this document include the natural, cultural, and social resources that would be directly, indirectly, or cumulatively impacted as a result of implementation of any alternative proposed in this EIS. This section of the document is organized such that the methodology for impact analysis is described separately in each resource section, followed by the analysis of each alternative.

Cumulative Impacts

Cumulative impacts are the effects on the environment that would result from the incremental impacts of the action when added to other past, present and reasonable foreseeable future actions. The cumulative actions are evaluated in concert with the impacts of an alternative to determine if there are cumulatively considerable and have any additional effects on a particular resource.

Table 4-1 provides a list of projects contributing to cumulative impacts at Warner Valley.

Impairment

In addition to determining the environmental consequences of all alternatives, *NPS Management Policies* and *Director's Order 12, Conservation Planning, Environmental Impact Analysis, and Decision-making*, requires analysis of potential effects to determine if actions would impair resources. In this EIS, determinations of impairment are provided in the conclusion section under each applicable resource topic for each alternative. In accordance with National Park Service (NPS) policy, impairment determinations are made for the following areas: geologic resources and hazards; biological resources; hydrology and water quality; soundscapes; cultural resources; and scenic resources.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on park and monument resources and values. However, the laws do give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is limited by statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

TABLE 4-1
LIST OF PROJECTS CONTRIBUTING TO CUMULATIVE IMPACTS AT WARNER VALLEY

Past

Prehistoric Period

Native Americans have been using Warner Valley for at least 4000 years.

Sifford Period (1900-1952)

This is the period of significance.

NPS Ownership or Influence: 1952-Present

1940s or 1950s – A leach field with 2000 feet of infiltrator pipe is constructed on the north side of Hot Springs Creek between the creek and the road. It was predominantly in the meadow.

1960 – The water system is renovated including new water tank, chlorination plant and water line.

1962 – The existing bathhouse (near pool) is built.

1963 – Two duplex cabins are constructed with Mission 66 funds.

1964 – NPS constructs a bridge and installs a force main across the Hot Springs Creek to a new leach field.

1980 – The existing swimming pool is refinished.

1986 – Wooden fence built around swimming pool.

1990 – Structural report on the historic structures indicates a need for improvement.

1990-2005 – The bulk of the water system is reconstructed.

1999-2008 – Sewer system components replaced.

2000 – A new water main from Drakesbad Guest Ranch to the Warner Valley campground is constructed.

2000s – Concessionaires allow employees to live in travel trailers.

2000s – NPS undertakes several large rehabilitation projects to improve the deteriorating buildings. All work is done in accordance with the Secretaries Standards for Historic Structures.

2001 – Waste water line from bathhouse back to Drakesbad Guest Ranch is slip-lined to prevent leakage.

2008 – Seismic retrofits completed on all non-historic buildings.

---- Trail work and boardwalk construction throughout Warner Valley

---- Periodic road maintenance.

Present

2009 - NPS is constructing a new leach field to replace the failing existing one. It will be located west of the current leach field location.

2009-2010 – Seismic retrofits are being performed on all historic structures.

Reasonably Foreseeable Future

2010 – NPS plans to conduct a fuel reduction treatment (thinning of the forest) to both sides of the Warner Valley Road. The corridor to be thinned would be approximately 500-1000 feet wide and extend east from Warner Valley approximately 2 miles to the park boundary.

The Park has requested funds to replace the fire sprinkler systems in all buildings.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely constitute impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; or
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park.

The following comparison table (**Table 4-2**) presents a concise summary of the impacts of each alternative within each resource section. This chapter follows with a separate section for each resource presenting an analysis of the environmental consequences of the Warner Valley Comprehensive Site Plan alternatives for all topics for each alternative, and makes a determination for cultural and natural resource topics for each alternative (impairment is not assessed for visitor experience, public health and safety, transportation, operations and facilities.)

**TABLE 4-2
IMPACT COMPARISON TABLE**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
Geologic Resources and Hazards		
<p>Alternative 1 would result in a local, long-term, minor, adverse impact because it results in continued soil compaction, soil loss, and degradation of peat soils in the meadow. Under this alternative, conditions that are detrimental to soil resources would not be adequately addressed or corrected.</p>	<p>Alternative 2 would have an overall moderate, long-term beneficial impact because it reverses damaging effects of erosion, soil compaction, and soil loss.</p>	<p>Alternative 3 would have an overall moderate, long-term, beneficial impact because it corrects adverse effects of soil compaction and soil loss.</p>
Hydrology and Water Quality		
<p>Alternative 1 would have an overall long-term, moderate, adverse impact because it results in 1) continued soil erosion, 2) altered natural surface water flow paths, and 3) water quality impacts. Under this alternative, conditions that are detrimental to the natural hydrologic regime and natural water quality would not be addressed or corrected.</p>	<p>Alternative 2 would have an overall long-term, moderate, beneficial impact because it reverses damaging effects of erosion, enhances surface water flow, improves water quality by reducing sedimentation, and removes Dream Lake Dam, a major impediment to surface water flow and a major contributor to the hydrologic regime.</p>	<p>Alternative 3 would have an overall long-term, moderate, beneficial impact because it corrects many of the adverse effects of erosion, it enhances surface water flow, and it improves water quality by reducing sedimentation.</p>
Vegetation		
<p>Under Alternative 1, ongoing impacts to vegetation would result in local, long-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be considered severe within the context of vegetative resources throughout Warner Valley.</p>	<p>Several activities associated with Alternative 2 would result in long-term, minor, adverse effects on vegetation. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be considered severe within the context of vegetative resources throughout Warner Valley. Additionally, many of the activities themselves are intended to ameliorate and repair existing degradation of vegetative resources. Restoration of currently degraded areas to a natural condition will be achieved using native stock. Therefore, the net effects of Alternative 2 should be a long-term, minor to moderate beneficial effect on vegetative resources and values.</p>	<p>Activities associated with Alternative 3 would result in long-term, minor, adverse effects on vegetation. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be considered severe within the context of vegetative resources throughout the Valley. Additionally, some of the activities themselves are intended to repair existing degradation of vegetative resources. Therefore, the net effects of Alternative 3 should be a long-term, minor, beneficial effect on vegetative resources and values.</p>
Wetlands		
<p>Under Alternative 1, ongoing impacts to wetlands would result in local, long-term, minor to moderate, adverse effects. While these impacts would be primarily localized, they would be spread throughout Warner Valley and their combined effects would continue to impact wetland resources and values.</p>	<p>Implementation of the preferred alternative would result in short-term, minor adverse effects on wetlands. However, the preferred alternative would also result in long-term, moderate, beneficial effects on wetlands throughout Warner Valley. There would be a net gain in wetland resources, functions, and values resulting from the preferred alternative and project implementation would serve to substantially reduce the existing impact of wetland resources in the Warner Valley.</p>	<p>As under Alternative 2, Alternative 3 would replace undersized culverts along Warner Valley Road and the day use parking area would be relocated and the wetland that it impinges on would be restored. Replacement of culverts along Warner Valley Road would result in temporary, short-term adverse impacts to wetlands and riparian vegetation where they are present in the streams near the road. Existing impacts on wetland resources in Warner Valley would be addressed to some extent under Alternative 3. The overall net effect on wetland resources</p>

**TABLE 4-2 (Continued)
IMPACT COMPARISON TABLE**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
<p>Wetlands (cont.)</p>		
<p>Wildlife</p> <p>Under Alternative 1, ongoing impacts to wildlife would result in short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley.</p> <p>Under Alternative 2 impacts to wildlife could result from construction of new facilities and other proposed activities and this would result in, short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley. In addition restoration and enhancement of currently degraded habitat would constitute a long-term, minor to moderate, beneficial, effect on wildlife.</p> <p>Under Alternative 3, impacts to wildlife could result from construction of new facilities and other proposed activities and this would result in local, short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley. In addition restoration and enhancement of currently degraded habitat would constitute a minor, beneficial effect on wildlife.</p>		
<p>Special-Status Species</p> <p>Under Alternative 1, ongoing impacts to special-status species would result in local, long-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species.</p> <p>Under Alternative 2, impacts to special-status species would result in local, short-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species. In addition, enhancement and restoration of habitat as a part of Alternative 2, could potentially result in long-term, minor to moderate, beneficial effects on special-status wildlife by increasing the extent of quality habitat and relocating certain facilities further away from sensitive resources.</p> <p>Under Alternative 3 impacts to special-status species would result in local, short-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species. In addition, enhancement and restoration of habitat as a part of Alternative 3 could result in long-term, minor, beneficial effects on special-status wildlife by increasing the extent of quality habitat and relocating certain facilities further away from sensitive resources.</p>		
<p>Soundscapes</p> <p>Alternative 1 would result in no new impacts to existing conditions. Therefore, Alternative 1 would have a long-term, minor, adverse impact given that Warner Valley has a greater impact under existing conditions on soundscapes than is currently desired by NPS (Eagan, 2009).</p> <p>Alternative 2 would have short-term, major, adverse impacts but long-term, minor, beneficial impacts.</p> <p>Alternative 3 would have short-term, moderate, adverse impacts but long-term, minor, beneficial impacts.</p>		

**TABLE 4-2 (Continued)
IMPACT COMPARISON TABLE**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
Archaeological Resources		
<p>The no action alternative would result in a long-term, minor, adverse impact on archaeological resources. The impact of this alternative on archaeological resources would be primarily localized and the effect would not be considered severe.</p>	<p>Impacts on archaeological resources with the implementation of Alternative 2 would result in a long-term, adverse impact due to damage from new construction, demolition, rehabilitation of existing facilities and utility corridors, visitor access, and natural processes. Such potential impacts would include deposits, loss of information, and changes in the integrity of archaeological sites. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11, Mitigation Measures).</p>	<p>Impacts on archaeological resources with the implementation of Alternative 3 would result in a long-term, minor, adverse impact due to damage from new construction, demolition, rehabilitation of existing facilities and utility corridors, visitor access, and natural processes. Such potential impacts would include deposits, loss of information, and changes in the integrity of archaeological sites. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11, Mitigation Measures).</p>
Cultural Landscape Resources		
<p>Dream Lake remains a shallow pond for a few years. In the near future the historic Dream Lake Dam will breach and NPS will not continue to maintain that unsafe dam. At that point it will be a moderate adverse impact because there will no longer be a Dream Lake but most of Dream Lake Dam will remain. Without active vegetation management in Drakesbad Meadow it is impossible to predict what will happen to the historic views. NPS will continue to maintain the ten contributing historic buildings to the secretary's standards. Garbage dumpsters and propane tanks will continue to have a minor adverse impact on the historic district. No action Alternative would result in a long-term, minor, adverse impact.</p>	<p>The contributing Dream Lake Dam is removed and the lake ceases to exist. This is a major adverse impact. In Drakesbad Meadow the ditches are filled but NPS manages the meadow vegetation consistent with the recommendations in the Cultural Landscape Report (CLR). The long-term impact to Drakesbad Meadow is difficult to predict but this may be a minor to moderate adverse impact. NPS will continue to maintain the ten contributing historic buildings to the secretary's standards. Beneficial impacts include relocating the park operations, administrative facilities, and utilities out of the historic district to a new service center which is out of sight. Although this alternative contains many beneficial impacts, the adverse impact of removing Dream Lake Dam outweighs the beneficial impacts: Alternative 2 would result in a long-term, major, adverse impact.</p>	<p>The contributing Dream Lake Dam is rebuilt to Bureau of Reclamation standards under this Alternative. The intended function of Dream Lake (swimming and boating) is restored. The historic integrity of the contributing Dream Lake Dam is lost. Since Sifford's intended function is maintained this is a moderate beneficial impact. In Drakesbad Meadow the ditches are dammed with sheet metal, however NPS manages the meadow vegetation consistent with the recommendations in the CLR. The long term impact is difficult to predict, but since the action is reversible this is a minor adverse impact. NPS will continue to maintain the ten contributing historic buildings to the secretary's standards. Beneficial impacts include relocating the park operations, administrative facilities, and utilities out of the historic district to new service center which is out of sight. Although the Dream Lake Dam loses historic integrity, the historic district will look and function similar to the period of significance: Alternative 3 would result in a long-term, moderate, beneficial impact.</p>
Visitor Experience		
<p>Visitors continue to make this area of the park a destination regardless of the existing design and layout. Some visitors may see the slow decline in facilities as adverse. Therefore, the No Action Alternative would have a long-term, minor, adverse effect.</p>	<p>While the most dramatic change would be the removal of Dream Lake Dam, overall the changes in this alternative would be viewed as beneficial by most visitors. During construction, Alternative 2 would have minor, short-term adverse impacts that would require temporary mitigation. Post-construction, Alternative 2 would result in long-term, moderate, beneficial impacts on visitor experience.</p>	<p>The reconstruction of Dream Lake Dam would ensure that recreation at Dream Lake would continue. This, in addition to the other upgrades to the facilities, would result in beneficial changes. Alternative 3 would have minor, short-term adverse impacts during construction, which would require temporary mitigation. Post-construction, Alternative 3 would result in long-term, minor, beneficial impacts on visitor experience.</p>

**TABLE 4-2 (Continued)
IMPACT COMPARISON TABLE**

Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
<p>Public Health and Safety</p> <p>Overall, the no-action alternative would have a minor, long-term, adverse impact.</p>	<p>Alternative 2 would result in a long-term, moderate, beneficial effect. However, some hazards on the road will continue. There would be short-term, negligible, adverse effects from construction activity, but this activity would not impact health and safety. Changes will make the area a more accessible place for those with limited mobility and safer for all.</p>	<p>Alternative 3 would result in a long-term, moderate, beneficial effect. There would be negligible, short-term, adverse effects from construction activity, but would not impact health and safety. Changes will make the area a more accessible place for those with limited mobility and safer for all.</p>
<p>Transportation</p> <p>The No-Action Alternative 1 would have a local, long-term, moderate, adverse effect. Continued operations in Warner Valley would cause local, long-term, moderate, adverse impacts to traffic flow and traffic safety conditions due to the unchanged alignment of Warner Valley Road and unchanged circulation patterns.</p>	<p>The Preferred Alternative 2 would have a short-term, minor to moderate, adverse effect, and a long-term, minor to moderate, beneficial effect. Alternative 2 would cause short-term, minor to moderate, adverse impacts (after mitigation) during site redevelopment; long-term, moderate, beneficial impacts to traffic flow conditions; and long-term, minor, beneficial effects on traffic safety/conflicts.</p>	<p>Alternative 3 would have a short-term, minor to moderate, adverse effect, and long-term, moderate, beneficial effect. Alternative 3 would cause short-term, minor to moderate, adverse impacts (after mitigation) during site redevelopment; and long-term, moderate, beneficial impacts to both traffic flow and traffic safety/conflicts.</p>
<p>Scenic Resources</p> <p>Alternative 1 would result in long-term, minor, adverse to existing conditions.</p>	<p>The proposed project will have a beneficial impact on Warner Valley's scenic resources. The removal of noncontributing features will preserve the historic viewshed of Drakesbad Guest Ranch and the view to Mount Harkness. The view of the night sky will continue to be relatively unobscured by external lighting. Consequently, the overall impact on scenic resource in Warner Valley is long-term, moderate, beneficial under Alternative 2.</p>	<p>The proposed project will have a beneficial impact on Warner Valley's scenic resources. The removal of noncontributing features will preserve the historic viewshed of Drakesbad Guest Ranch and the view to Mount Harkness. The view of the night sky will continue to be relatively unobscured by external lighting. Consequently, the overall impact on scenic resource in Warner Valley is long-term, moderate, beneficial under Alternative 3.</p>
<p>Operations and Facilities</p> <p>If no change occurs in the existing conditions of the park operations and facilities, adverse impact of both natural and cultural resources is likely to occur. The impact of this alternative on park operations and facilities would be primarily localized and the effect would not be considered severe. Over time, conditions would continue to be degraded. The no-action alternative would have a long-term, moderate, adverse effect.</p>	<p>Alternative 2 would have a long-term, moderate, beneficial effect. The impact of this alternative on park operations and facilities would be primarily localized and the effect would not be considered severe. Removal of trees and other construction-related impacts would result in short-term, moderate, adverse effects.</p>	<p>Alternative 3 would have an overall long-term, moderate, beneficial effect.</p>

4.1 Geologic Resources and Hazards

Methodology

Geologic Resources

This analysis reviewed and compiled available information regarding the geologic resources in the Warner Valley area that could be adversely or beneficially impacted by the proposed actions. In Lassen Volcanic National Park, geologic resources can include soils, volcanic features, hot springs, areas underlain by peat, or other phenomena pertaining to volcanic activity. For the proposed project, soil compaction, soil loss, and resultant erosion effects have been identified as the primary impacts to geologic resources. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Impact Description
Negligible	Geologic resources would not be affected or the effects to resources would be below or at the lower levels of detection. Any effects to geologic resources would be slight.
Minor	The effect on geologic resources would be detectable. Effects to resource areas would be small. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.
Moderate	The effect on geologic resources would be readily apparent and result in a change to the resource character over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely be successful.
Major	The effect on geologic resources would be readily apparent and substantially change the character of the resource over a large area in and out of the park. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

Duration:
Short-term – Impacts to the resource would last less than 3 years.
Long-term – Geologic resources would take more than 3 years to recover.

Type:
Beneficial – Effects that would preserve and protect geologic resources or would reduce features that impact geologic resources in the project area.
Adverse – Effects that would degrade or reduce geologic resources or would increase features that impact geologic resources in the project area

Geologic Hazards

The impact analysis of geologic and seismic hazards is based on conclusions developed through review of known, potential geologic hazards that could exist in the Warner Valley area. Information was derived from review of existing literature, studies and information provided by staff at the National Park Service and other agencies, and from park staff insights and professional judgment. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Impact Description
Negligible	The action would result in a changed vulnerability to geologic hazards, but the change would be so small that it would not be of any measurable or perceptible consequence.
Minor	The action would result in a changed vulnerability to geologic hazards, but the change would be small and localized and of little consequence.
Moderate	The action could result in a changed vulnerability to geologic hazards; the change would be measurable and of consequence.
Major	The action would result in a noticeable changed vulnerability to geologic hazards; the change would be measurable and result in a severely adverse or substantial beneficial impact.

Duration:
Short-term – There are no short-term geologic hazard impacts.
Long-term – All geologic hazards impacts would be long-term.

Type:
Beneficial – Effects that would preserve and protect geologic resources or would reduce features that impact geologic resources in the project area.
Adverse – Effects that would degrade or reduce geologic resources or would increase features that impact geologic resources in the project area

Analysis of Environmental Consequences – Alternative 1 (No Action)

Geologic Resources and Hazards

Analysis

Under Alternative 1, erosion and compaction by human traffic and vehicles would continue to adversely affect soil resources in traveled areas. Areas of impact could include the campground with the current level of human traffic and the unprotected dirt slopes and uncontrolled parking areas that encroach on natural areas. The loss of peat soils in Drakesbad Meadow through oxidation caused by lowered water levels and/or human foot traffic would remain a potential impact. Impacts associated with earthquake ground shaking or seismic-induced soil failure were not identified.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Past, present, and future actions influencing the natural geologic/soil conditions in Warner Valley include increased visitor throughout the years, the existing level of landscape and road maintenance, and future development or expansion of Warner Valley facilities.

Conclusion

Alternative 1 would result in a local, long-term, minor, adverse impact because it results in continued soil compaction, soil loss, and degradation of peat soils in the meadow. Under this

alternative, conditions that are detrimental to soil resources would not be adequately addressed or corrected.

Impairment: Under Alternative 1 no geologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park. Neither would there be effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's geologic resources.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Geologic Resources and Hazards

Analysis

Under Alternative 2, areas of erosion, soil loss, and soil compaction would be reconditioned and vegetated or closed to human and vehicular traffic. For instance, replacement of the road to the ranger station water tank would correct the current erosion condition while relocation of the lower campground would reduce soil loss by human traffic to Hot Springs Creek. Parking throughout Warner Valley would be improved to avoid vehicular impacts to natural areas. Trails would be improved with boardwalks to reduce impacts to sensitive meadow soils. Restoring Drakesbad Meadow would improve the health and function of the fen and protect the unique peat/hydric soil. The removal of Dream Lake Dam would eliminate an area containing problematic, unengineered soils.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Table 4-1 provides a list of projects occurring in the past, present and future of Warner Valley. Past, present and future actions that improve, preserve and protect soil resources in Warner Valley include general road maintenance and smaller scale restoration projects that have been implemented in the past, are underway today, or are proposed for the future.

Conclusion

Alternative 2 would have an overall moderate, long-term beneficial impact because it reverses damaging effects of erosion, soil compaction, and soil loss.

Impairment: Under Alternative 2 no geologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's geologic resources.

Analysis of Environmental Consequences – Alternative 3

Geologic Resources and Hazards

Analysis

Alternative 3 is similar to Alternative 2 in that existing areas that are susceptible to erosion and soil loss would be addressed and corrected. Considering soil impacts and remedies, there is not a sizeable difference between in the two alternatives. Reconstruction of the Dream Lake Dam would improve an area that currently contains problematic, unengineered soil.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Table 4-1 provides a list of projects occurring in the past, present and future of Warner Valley. Past, present, and future actions that improve, preserve, and protect the soil resources in Warner Valley include smaller scale restoration projects and general road maintenance.

Conclusion

Alternative 3 would have an overall moderate, long-term, beneficial impact because it corrects adverse effects of soil compaction and soil loss.

Impairment: Under Alternative 3 no geologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource value highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's geologic resources.

4.2 Hydrology and Water Quality

Methodology

Hydrology

Hydrology refers to hydrologic surface water processes such as surface water runoff, stream flooding, erosion and deposition, and channel movement. Hydrogeology refers to the movement of groundwater through subsurface geologic strata. Particular attention is given to alterations or restoration of water flow (e.g., diversions, impediments to flow, or release of spring flow) and placement or removal of facilities in Warner Valley that are subject to inundation or potential damage by flooding. The National Park Service *Freshwater Resource Management Guidelines* (found in NPS-77) requires the National Park Service (NPS) to “maintain, rehabilitate, and perpetuate the inherent integrity of water resources and aquatic ecosystems.”

Impact Intensity	Impact Description
Negligible	There would be no change in the natural surface or groundwater flow rates or patterns. Project would not affect flood flow patterns.
Minor	Changes to the natural surface or groundwater flow rates, or patterns would be measurable and local. The project would remove or add structures subject to inundation by flooding, but damage associated with flooding is unlikely and flood flow velocity or patterns would not change. No mitigation would be needed.
Moderate	Changes in natural surface or groundwater flow or patterns would be measurable and local. Project would remove or add structures subject to inundation and damage by flooding, but would not change flood flow velocity or alter the pathway of flood flows.
Major	Changes in natural surface or groundwater flow or patterns would be measurable and widespread. Project would contribute to changes in flood flow velocity or alter the pathway of flood flows.

Duration:
Short-term – Usually less than one year. Impacts would not be measurable or measurable only during the life of construction.
Long-term – Usually more than one year. Impacts would be measurable during and after project construction.

Type:
Beneficial – Effects that would improve natural surface or groundwater flow or patterns or would reduce features that impede natural surface or groundwater flow or patterns in the project area.
Adverse – Effects that would degrade or reduce natural surface or groundwater flow or patterns or would increase features that impede natural surface or groundwater flow or patterns in the project area

Water Quality

The National Park Service *Management Policies 2006* state that the Park Service will “take all necessary actions to maintain or restore the quality of surface waters and groundwater within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations.”

A water quality standard defines the water quality goals of a waterbody by designating uses to be made of the water, by setting minimum criteria to protect the uses, and by preventing degradation of water quality through antidegradation provisions. The antidegradation policy is only one portion of a water quality standard. Part of this policy (40 Code of Federal Regulations [CFR] 131.12(a)(2)) strives to maintain water quality at existing levels if it is already better than the minimum criteria. Antidegradation should not be interpreted to mean that “no degradation” can or will occur, as even in the most pristine waters, degradation may be allowed for certain pollutants as long as it is temporary and short-term.

Other considerations in assessing the magnitude of water quality impacts are the effect on those resources dependent on a certain quality or condition of water. Sensitive aquatic organisms, submerged aquatic vegetation, riparian areas, and wetlands are affected by changes in water quality from direct and indirect sources.

Given the above water quality issues and methodology and assumptions, the following impact thresholds were established in order to describe the relative changes in water quality under the alternatives.

Impact intensity	Impact Description
Negligible	Impacts (chemical, physical, or biological effects) would not be detectable, would be well below water quality standards or criteria, and would be within historical or desired water quality conditions.
Minor	Impacts (chemical, physical, or biological effects) would be detectable but would be well below water quality standards or criteria and within historical or desired water quality conditions.
Moderate	Impacts (chemical, physical, or biological effects) would be detectable but would be at or below water quality standards or criteria; however, historical baseline or desired water quality conditions would be temporally altered.
Major	Impacts (chemical, physical, or biological effects) would be detectable and would be frequently altered from the historical baseline or desired water quality conditions; and/or chemical, physical, or biological water quality standards or criteria would temporarily be slightly and singularly exceeded.

Duration:
Short-term – Following treatment, recovery would take less than one year.
Long-term – Following treatment, recovery would take longer than one year.

Type:
Beneficial – Effects that would improve water quality or would reduce features that impede water quality in the project area.
Adverse – Effects that would degrade or reduce water quality or would increase features that impede water quality in the project area

Analysis of Environmental Consequences – Alternative 1 (No Action)

Erosion, Impeded Surface Water Flow, and Water Quality

Analysis

Under Alternative 1, current areas in Warner Valley that create erosion, impede surface water flow, and/or degrade water quality through sedimentation or release of foreign contaminants, would remain unimproved. The placement of the fee station and the road to the water tank at the ranger station would remain and continue to impede surface drainage and result in sediment delivery to local water bodies. The current maintenance issues would remain for the entry road; specifically, the potential for slope instability, blocking of drainage into creeks, and inadequate drainage. The campground would remain in its current location and human traffic and the unprotected, dirt slopes would continue to cause erosion that could eventually lead to increased sediment delivery to Hot Springs Creek. Unstable banks along Hot Springs Creek would remain in current conditions with armor consisting of cobble/rock-filled gabion mesh baskets at the Drakesbad Guest Ranch pool. At Drakesbad Guest Ranch, the edge creep in the parking area and roads would continue to create large impacted areas and unclear traffic zones and road base used on roads and trails would continue to obstruct natural water flow to the meadow and fen. The impermeable trail/road to the pool and bathhouse would continue to create an obstruction to surface water flow. In addition, the major trail leading from the corral to the trail network on the south side of the meadow would remain constructed of compacted gravel creating an obstruction to surface water flow through the meadow/ fen complex. The present location of the corral would remain and effluent from the corral would continue to flow into Drakesbad Meadow, creating a potential for surface water degradation. Based on the severity of the current erosion, hydrology and water conditions at the identified locations, Alternative 1 (No-Action) would result in continued soil erosion, man-made impediments to surface water flow, and threats to water quality in the creeks and the meadow.

Drakesbad Meadow

Analysis

Alternative 1 would not alter the current hydrologic regime in Drakesbad Meadow. The footpaths, water tank road, and ditches have changed the meadow and fen from its original, natural hydrologic condition by draining surface water and impeding or altering surface water flow to and across the meadow. Over the long term under Alternative 1, surface water flow and shallow groundwater levels could continue to decrease resulting in further alteration of the meadow environs. However, the changes to the meadow and fen as a result of continued human activity would be gradual. Although the NPS has implemented some measures to improve the flow into and across the meadow, Alternative 1 would not fully protect and preserve the hydrologic character of the meadow or fen into the future. Activities surrounding the meadow (i.e. lodging, vehicle parking and the horse corral) would continue to threaten surface water quality.

Dream Lake Dam

Analysis

Under Alternative 1, Dream Lake Dam would remain in its current condition and not be repaired, replaced, or removed. The NPS would continue to discourage the population of beavers from altering the flow on the spill way and minor repairs may be completed by hand only (no heavy equipment work) after large rain storms or snow events. The dam would continue to be in a weakened state with a risk of failure. Because of its size and the volume of water it contains, failure of the dam would cause localized, manageable flooding, which is not expected to cause injury to park staff and visitors or damage to structures. Under this alternative, the dam would remain as a man-made restriction to the natural surface water flow and the overall hydrologic system that includes tributaries that feed into Hot Springs Creek.

Alternative 1 does present the possibility that, some time in the future, the dam could fail naturally without human intervention. Complete catastrophic collapse of the entire dam face is less probable. However, it is likely that the berm would fail at one or more V-shaped breaches that would gradually enlarge as the water flowed through the berm. Flood waters would probably flow downstream at a near consistent rate until the lake is drained. Considering the volume and depth of the water behind the dam, it is likely that Hot Springs Creek could accommodate the flood flows, although some water could reach the meadow.

Alternative 1 would not alter the dam from its original condition and therefore, it would remain as a man-made impediment to natural surface water flows and a failure risk. Failure of the dam would cause localized flooding and temporary increased sedimentation, but would not cause injury or damage to structures. However, if the dam failed without human intervention at some time in the future, failure and subsequent restoration would remove an impediment to natural surface water flow, provide additional flows to Hot Springs Creek and the meadow, and improve water quality.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Past, present and future actions influencing the natural hydrologic regime and water quality in Warner Valley include the meadow draining activities and livestock grazing in the early years, increased visitor use throughout the years, the construction of the Dream Lake Dam, periodic trail work and the boardwalk construction, the existing level of landscape and road maintenance, and future development or expansion of Warner Valley facilities.

Conclusion

Alternative 1 would have an overall long-term, moderate, adverse impact because it results in 1) continued soil erosion, 2) altered natural surface water flow paths, and 3) water quality impacts. Under this alternative, conditions that are detrimental to the natural hydrologic regime and natural water quality would not be addressed or corrected.

Impairment: Under Alternative 1 no hydrologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park due to changes in hydrology, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's hydrology and water quality.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Erosion, Impeded Surface Water Flow, and Water Quality

Analysis

Under Alternative 2, many of the existing erosion areas, impediments to surface flows, and conditions leading to degradation of water quality would be corrected. At the entry of Warner Valley, the fee station would be relocated away from the natural drainage way. Replacement of the road to the ranger station water tank would correct the current erosion condition. Impediments to drainage would be corrected throughout valley entry area by efforts to replace undersized and failing culverts and construct headwalls. Erosion and potential water quality issues would be reduced, if not eliminated, by closing the lower campground. Parking throughout Warner Valley would be improved to avoid vehicular impacts to natural areas. Surface water flow to the fen would be improved by reconfiguring the water tank road. Trails would be improved with boardwalks and new base material to improve infiltration, remove impediments to surface flows, and reduce erosion. Eroding stream banks near the pool would be stabilized to reduce erosion and improve water quality. Given the many improvements prescribed by the project, Alternative 2 would result in reduced soil erosion, elimination of man-made impediments to surface water flow, and improved water quality in the creeks and the meadow.

Drakesbad Meadow

Analysis

Alternative 2 would implement recommendations provided to the NPS through the hydrologic characterization and restoration study completed by Lindsay Patterson and Colorado State University (Patterson, 2005). The most significant improvement would be the filling of man made ditches throughout the meadow and other improvements to increase surface water flow to the meadow from the upland springs. Backfilling the ditches is a long-term restoration strategy, which would initiate more flow across the meadow. Under Alternative 2, the NPS would continue implementing measures to improve the flow into and across the meadow. Improvements to the meadow, coupled with other local actions under Alternative 2 would further enhance water quality and quantity in the meadow and fen.

Dream Lake Dam

Analysis

Under Alternative 2, the dam at Dream Lake would be removed, the surrounding area graded, and the borrow pit adjacent to the dam would be backfilled. A construction project of this magnitude would result in short-term adverse effects to soils (erosion), hydrology (impeded flows), and water quality (sedimentation and erosion) due to the amount of materials and equipment required. Short-term impacts include soil erosion and sedimentation to creeks. Strategies to avoid sensitive hydrologic and soil resources would be developed by the NPS and could include the requirement that work be performed during the winter snow season to reduce ground surface impacts. Necessary restoration would be performed in the immediate area to ensure that the four tributaries currently feeding Dream Lake would converge and flow towards Hot Springs Creek and Drakesbad Meadow in much the same way as they did prior to dam construction. Alternative 2 would restore the natural, pre-development hydrologic regime. Removal of the dam and restoration of the tributaries would enhance flows downstream to Hot Springs Creek and possibly to Drakesbad Meadow and the fen, especially in periods of high flow. Removal of the dam would not increase flooding hazard in Warner Valley because Hot Springs Creek possesses the capacity to accommodate flows that would have otherwise been detained behind the dam. By removing the dam, Alternative 2 would restore flows and preserve a major component of the natural hydrologic system in Warner Valley.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Past, present and future actions that improve, preserve and protect the hydrologic regime in Warner Valley, recent efforts by the NPS to return flows to Drakesbad Meadow and other smaller scale restoration projects that were implemented in the past, that are underway today, or are proposed for the future.

Conclusion

Alternative 2 would have an overall long-term, moderate, beneficial impact because it reverses damaging effects of erosion, enhances surface water flow, improves water quality by reducing sedimentation, and removes Dream Lake Dam, a major impediment to surface water flow and a major contributor to the hydrologic regime.

Impairment: Under Alternative 2 no hydrologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the hydrologic and cultural integrity of the park, nor effects to the hydrologic resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's hydrology and water quality.

Analysis of Environmental Consequences – Alternative 3

Erosion, Impeded Surface Water Flow, and Water Quality

Analysis

Alternative 3 is similar to Alternative 2 in that many of the existing erosion areas, impediments to surface flows, and conditions leading to degradation of water quality would be corrected under each alternative. However, from the perspective of erosion, surface water flow, and water quality, Alternative 3 includes flow impediment at Dream Lake, while Alternative 2 removes the Dream Lake Dam.

Given the many improvements to adverse erosion, surface flow, and potential water quality conditions throughout the project area, Alternative 3 would result in reduced soil erosion, elimination of man-made impediments to surface water flow, and improved water quality in the creeks and the meadow.

Drakesbad Meadow

Analysis

Similar to Alternative 2, Alternative 3 would implement recommendations provided to the NPS through the hydrologic characterization and restoration study completed by Lindsay Patterson and Colorado State University (Patterson, 2005). The most significant difference is that Alternative 3 would use sheet metal dams in the existing ditches to impede flow from the meadow rather than filling the ditches. Although this may be an effective solution to reducing water drainage from the meadow, it would be less effective than filling the ditches, as proposed in Alternative 2. Filling the ditches can be considered a long-term restoration approach because it reestablishes surface flow across the path of the ditch thus restoring sheet flow across the meadow. The use of sheet metal dam would be more appropriate if used during pilot restoration projects to determine the interaction of surface flow on the meadow floor and in the ditches. Under Alternative 3, the NPS would continue implementing measures to improve the flow into and across the meadow. Improvements to the meadow, coupled with other local actions under Alternative 3 would further enhance water quality and quantity in the meadow and fen.

Alternative 3 proposes the use of sheet metal dams to reduce flow through exiting drainage ditches in the meadow. This is a less effective, shorter-term solution than filling the ditches as proposed in Alternative 2. Because of this, long-term effects of restoration on the meadow may not be realized as readily under Alternative 3 as they would under Alternative 2.

Dream Lake Dam

Analysis

Under Alternative 3, the dam at Dream Lake would be repaired and would be higher than the existing dam. A construction project of this magnitude would result in short-term adverse effects

to soils (erosion), hydrology (impeded flows), and water quality (sedimentation and erosion) due to the amount of materials and equipment required. Short-term impacts include soil erosion and sedimentation to creeks. Strategies to avoid sensitive hydrologic and soil resources would be developed by the NPS and could include the requirement that work be performed during the winter snow season to reduce ground surface impacts. Alternative 3 would not remove the dam and therefore, a major impediment to the restoration of the natural hydrologic regime of Warner Valley would remain.

Alternative 3 would reconstruct Dream Lake Dam. From a hydrologic and water quality perspective, Alternative 3 does not restore or preserve the natural character or hydrologic system in Warner Valley. In addition, such a construction project could degrade water quality and trigger soil erosion.

Cumulative Impacts

Cumulative effects are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Past, present and future actions that improve, preserve, and protect the hydrologic regime and systems in Warner Valley include recent efforts by the NPS to return flows to Drakesbad Meadow and other smaller scale restoration projects that were implemented in the past, are underway today, or are proposed for the future.

Conclusion

Alternative 3 would have an overall long-term, moderate, beneficial impact because it corrects many of the adverse effects of erosion, it enhances surface water flow, and it improves water quality by reducing sedimentation.

Impairment: Under Alternative 3 no hydrologic resources specific to the park's purpose would be discernibly affected, and there would be no change to the hydrologic and cultural integrity of the park, nor effects to the hydrologic resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's hydrology and water quality.

References

Patterson, L. and D.J. Cooper, 2005. *Hydrologic Characterization of a Mountain Fen Complex, Drakesbad Meadow, Lassen Volcanic National Park, Cascade Range, California*, Colorado State University, Graduate Thesis.

4.3 Vegetation, Wetlands, Wildlife, and Special-status Species

Methodology

Vegetation

Available information on vegetation and vegetative communities potentially impacted at the project site was compiled. Predictions about short- and long-term site impacts were based on previous projects with similar vegetation and recent studies. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Impact Description
Negligible	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be on a small scale and no species of special concern would be affected.
Minor	The alternative would affect some individual native plants and would also affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective.
Moderate	The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population and over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected.
Major	The alternative would have a considerable effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.

Duration:
Short-term – Recovers in less than three growing seasons.
Long-term – Takes more than three growing seasons to recover.

Type:
Beneficial – Effects that would improve and enhance the conditions and/ or extent of vegetation within the project area.
Adverse – Effects that would degrade the condition and/or or reduce the extent of vegetation within the project area.

Wetlands

Wetlands are “lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface” (Cowardin, 1979). Executive Order 11990 (“Protection of Wetlands”) requires an examination of impacts to wetlands; and protecting wetlands. The National Park Service has adopted a “no net loss” of wetlands. The planning team based the impact analysis and the conclusions for possible impacts on wetlands on the on-site inspection of known and potential jurisdictional wetlands within the park, review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and park staff insights and

professional judgment. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Impact Description
Negligible	Wetlands would not be affected or the effects would be below or at the lower levels of detection.
Minor	The effects to wetlands would be detectable and relatively small in terms of area and the nature of the change. The action would affect a limited number of individuals of plant or wildlife species within the wetland.
Moderate	The effects to wetlands would be readily apparent over a relatively small area but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measurable effect on plant or wildlife species within the wetland, but all species would remain indefinitely viable.
Major	The effects to wetlands would be readily apparent over a relatively large area. The action would have measurable consequences for the wetland area that could not be mitigated. Wetland species would be at risk of extirpation from the area.

Duration:
Short-term – Recovers in less than three years.
Long-term – Takes more than three years to recover.

Type:
Beneficial – Effects that would improve and enhance the conditions and/ or extent of wetlands within the project area.
Adverse – Effects that would degrade the condition and/or or reduce the extent of wetlands within the project area.

Wildlife

The National Park Service Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise they are protected from harvest, harassment, or harm by human activities. According to National Park Service *Management Policies 2006*, the restoration of native species is a high priority. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals. Information on wildlife was taken from park documents and records. Park natural resource management staff also provided wildlife information.

Impact intensity	Impact Description
Negligible	There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
Minor	Impacts would be detectable, but they would not be expected to be outside the natural range of variability of native species' populations, their habitats, or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Impact intensity	Impact Description
Moderate	Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the parks unit. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability. Key ecosystem processes might be disrupted. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Duration:
Short-term – Recovers in one year or less.
Long-term – Takes more than one year to recover.

Type:
Beneficial – Effects that would improve and enhance the distribution and/ or population numbers of wildlife species within the project area.
Adverse – Effects that would reduce the distribution and/ or population numbers of wildlife species within the project area.

Special-status Species

The Endangered Species Act (16 USC 1531 et seq.) mandates that all federal agencies consider the potential effects of their actions on species listed as threatened or endangered. If the National Park Service determines that an action may adversely affect a federally listed species, consultation with the U.S. Fish and Wildlife Service is required to ensure that the action will not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. National Park Service *Management Policies 2006* state that potential effects of agency actions will also be considered on state or locally listed species. The National Park Service is required to control access to critical habitat of such species, and to perpetuate the natural distribution and abundance of these species and the ecosystems upon which they depend. Information on possible threatened, endangered, candidate species and species of special concern was gathered from the National Park Service and U.S. Fish and Wildlife Service. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Impact Description
Negligible	The action could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence.
Minor	The action could result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable but small and localized and of little consequence. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate	The action would result in some change to a population or individuals of a species or designated critical habitat. The change would be detectable and could be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.

Impact Intensity	Impact Description
Major	The action would result in a substantial change to a population or individuals of a species or designated critical habitat. Impacts would be expected to be outside the natural range of variability and might affect the viability of at least some special-status species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.
<u>Duration:</u>	
<i>Short-term</i> – Recovers in less than 1 year for animals and within 1 growing season for plants.	
<i>Long-term</i> – Takes more than 1 year to recover for animals and more than 1 growing season for plants.	
<u>Type:</u>	
<i>Beneficial</i> – Effects that would improve and enhance the distribution and/ or population numbers of special status-species within the project area.	
<i>Adverse</i> – Effects that would reduce the distribution and/ or population numbers of special status-species within the project area.	

Analysis of Environmental Consequences – Alternative 1 (No Action)

Alternative 1 proposes no action, which assumes that no substantive changes will be made to the area. Under this alternative, the existing fee station would remain unchanged and the campground would be maintained in its present location and condition. Small scale features would remain in their present locations and conditions, as would the bathhouse, pool, and circulation facilities.

Vegetation

Analysis

Under the no action alternative facilities would remain basically unchanged in Warner Valley. The ranger station water tank road would remain in place and the entry road and campground would remain unchanged. Currently dust from the entry road and campground affects vegetation in close proximity to these areas. Poorly situated facilities and trail connections encourage “social trails” that have adverse impacts on vegetation. Poorly delineated parking areas and trails degrade vegetation locally as well. Proximity of the horse corral to Drakesbad Meadow facilitates the spread of exotic vegetation in this unique ecosystem.

Cumulative Impacts

Cumulative impacts to vegetation resources are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, development of the resort, and draining of the meadow, have resulted in long-term moderate degradation of vegetative resources in Warner Valley. Under Alternative 1, localized minor adverse effects on vegetation would continue in developed areas throughout Warner Valley, along trails, in and around campgrounds, and in and around existing facilities at Drakesbad Guest Ranch. In the future, fire management activities such as prescribed burns and mechanical thinning projects would occur.

Conclusion

Under Alternative 1, ongoing impacts to vegetation would result in local, long-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be considered severe within the context of vegetative resources throughout Warner Valley.

Impairment: Under Alternative 1 the vegetation resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the vegetation resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's vegetative resources.

Wetlands

Analysis

Multiple existing impacts on wetland resources in Warner Valley would continue under Alternative 1. The trails crossing Drakesbad Meadow would continue to block water flow through that complex fen/wet meadow ecosystem, undersized culverts along Warner Valley Road would continue to cause headcutting and erosion in the small streams crossing the road, the location of the trailhead parking lot within a wetland would remain unchanged, and Dream Lake Dam, which has significantly altered local hydrology on the south slopes of Warner Valley would remain in place. Drakesbad Meadow and its fen hydrology have been studied (Patterson, 2005) and some preliminary actions to restore hydrology to this area have already been implemented. However, further actions are needed to more fully restore the functions and values of this unique natural resource.

Cumulative Impacts

Cumulative impacts on wetlands are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have resulted in long-term major degradation of wetland resources in Warner Valley.

Conclusion

Under Alternative 1, ongoing impacts to wetlands would result in local, long-term, minor to moderate, adverse effects. While these impacts would be primarily localized, they would be spread throughout Warner Valley and their combined effects would continue to impact wetland resources and values.

Impairment: Under Alternative 1 no wetland resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's wetlands.

Wildlife

Analysis

Numerous wildlife species inhabit the Warner Valley area. The wildlife assemblage present likely varies on a seasonal basis. Those that are most common in the forests and meadows adjacent to developed areas during the summer months when visitation is highest would generally be species that are tolerant of, if not habituated to, human presence and activity. For example, black bears, marmots, chipmunks, squirrels, and jays are attracted to food sources provided by the human activity in the campground and at Drakesbad Guest Ranch. Winter may see less tolerant species present within the developed areas but these species likely retreat to areas less frequented by humans during the summer. The long standing development of Warner Valley has resulted in localized degradation of wildlife habitat.

Cumulative Impacts

Cumulative impacts on wildlife are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have resulted in local, long-term, minor to moderate effects on wildlife resources in Warner Valley, primarily through degradation of habitat.

Conclusion

Under Alternative 1, ongoing impacts to wildlife would result in short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley.

Impairment: Under Alternative 1 no wildlife species specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's wildlife resources.

Special-status Species

Analysis

Thirty-seven special-status species were determined to have potential to occur within Warner Valley, 15 animals and 22 plant species. A number of bird species, such as spotted owl, greater sandhill crane, willow flycatcher, yellow warbler, and rufous hummingbird are known from Warner Valley. Distribution of special-status bats within the Park is not well known and there is a moderate potential for several species, including silver-haired bat, fringed myotis, and Yuma myotis, to occur in the forests within and adjacent to developed areas. Otherwise, special-status wildlife are generally not expected to occur within developed areas of Warner Valley due to the

relatively high levels of habitat disturbance and human use. Since facilities would remain the same under Alternative 1 only negligible to minor adverse effects to special-status wildlife are expected. For the most part special-status plants are not likely to be found in developed areas either. However, most of these plants are found in wetlands, wet meadows, or along creeks and if present near trails, roads and other existing facilities, may be subject to local, minor, adverse effects resulting from human caused erosion and trampling, displacement by invasive exotic species, and alteration of wetland hydrology in Drakesbad Meadow, along the main access road and the two water tanks access roads.

Cumulative Impacts

Cumulative impacts on special-status species are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have undoubtedly resulted in local, long-term, moderate adverse effects on special-status plants and wildlife in Warner Valley, primarily through degradation of habitat. For example, with the advent of human uses in the Warner Valley, wildlife species sensitive to human presence undoubtedly moved out of the area. Although the original vegetative composition of Drakesbad Meadow is unknown it possible that alteration of meadow and fen hydrology resulted in extirpation of certain plant species.

Conclusion

Under Alternative 1, ongoing impacts to special-status species would result in local, long-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species.

Impairment: Under Alternative 1 no special status resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's special-status wildlife or plant populations.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Alternative 2 would relocate the fee station to a new area west of the historic Ranger Station, complete circulation improvements to parking and pull-out areas near the new fee station, construct a new service road and improve the existing Warner Valley Road, as well as convert the existing lower campground to day use parking. The existing day use parking area would be closed. Various campground improvement projects are proposed for the upper campground. Within Drakesbad Guest Ranch, employee housing and parking would be relocated and combined with added facilities. The current bathhouse would be slightly expanded and renovated. When existing facilities are closed and relocated, such as the fee station and the day use parking area, the areas will be restored to natural conditions. Also under this alternative, Drakesbad Meadow

hydrology would be enhanced and restored, through the filling of man-made ditches and replacement of existing trails across the meadow with boardwalks or permeable surfaces. Under this Alternative, Dream Lake dam would be removed and the historic stream channels, now inundated by the lake, as well as the dam borrow pit, would be restored to natural conditions.

Vegetation

Analysis

Implementation of the preferred alternative would result in the removal of trees, most of these in association with the Dream Lake Dam removal and several in association with relocation of existing facilities. Alternative 2 would also result in removal of existing vegetation in association with construction of the new concessioner housing and service center and the utility lines to serve them, as well as new trails, campground spaces, and access roads. These would be considered local, minor, adverse effects on vegetation. However, under the preferred alternative many of the facilities and land uses that are currently resulting in minor adverse impacts on vegetation would be addressed. Dust from the entry road would be controlled through the installation of new aggregate and application of environmentally approved dust suppressants. Relocating facilities and improving trail connections would reduce the incidence of “social trails” that have adverse impacts on vegetation. Establishing clearly delineated parking areas would also reduce adverse effects on surrounding vegetation. The horse corral would remain in its current location but use of the lower corral would be discontinued and a bio-filtration system would be added to mitigate the effects of effluent on natural habitat “downstream” of the corral. Closure of the existing day use parking area and relocation of employees housing and minor facilities would be followed by restoration of currently degraded areas to a natural condition. These are each considered local, minor to moderate beneficial effects on vegetation. Therefore, implementation of Alternative 2 would result in a net beneficial effect on vegetation and would not result in a long-term impact on vegetative resources within the Warner Valley.

Cumulative Impacts

Cumulative impacts to vegetation resources are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, development of the resort, and draining of the meadow, have resulted in long-term moderate degradation of vegetative resources in Warner Valley. Under Alternative 2 adverse effects on vegetation occur in conjunction with construction of new facilities, trails and roads. However, many of the proposed actions under Alternative 2 are intended to address existing sources of degradation by moving facilities away from sensitive habitat and active restoration of multiple areas that are currently degraded. In the future, fire management activities such as prescribed burns and mechanical thinning projects would occur.

Conclusion

Several activities associated with Alternative 2 would result in long-term, minor, adverse effects on vegetation. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be

considered severe within the context of vegetative resources throughout Warner Valley. Additionally, many of the activities themselves are intended to ameliorate and repair existing degradation of vegetative resources. Restoration of currently degraded areas to a natural condition will be achieved using native stock. Therefore, the net effects of Alternative 2 should be a long-term, minor to moderate beneficial effect on vegetative resources and values.

Impairment: Under Alternative 2 no vegetation resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's vegetation resources.

Wetlands

Analysis

The proposed actions under the preferred alternative have been designed to avoid and minimize potential impacts to wetlands. Replacement of culverts along Warner Valley Road would result in temporary, short-term adverse impacts to wetlands and riparian vegetation where they are present in the streams near the road. However, multiple existing impacts on wetland resources in Warner Valley would be addressed under Alternative 2. The existing water tank access road near the ranger station would be relocated out of a drainage. The undersized culverts along Warner Valley Road would be replaced and headcutting and erosion in the small streams crossing the road would be repaired and restored to a natural state. The day use parking area would be relocated and the wetland that it impinges on would be restored. Drakesbad Meadow and its fen hydrology have been studied (Patterson, 2005) and based on the recommendations of the study, some preliminary actions to restore hydrology to this area have already been implemented. However, further actions are needed to more fully restore the functions and values of this unique natural resource. Under the preferred alternative, Drakesbad Meadow surface hydrology would be restored and enhanced through several actions: trails crossing the meadow would be replaced with boardwalks or rebuilt using permeable beds; the existing drainage ditches constructed to dewater portions of the meadow would be filled; and the existing water tank road at the western end of Drakesbad Meadow would be rebuilt with a permeable road bed and narrower width to enhance water flow to the meadow and fen below. The existing culverts that have been placed in this road would also be maintained. The eroding banks of Hot Springs Creek in the vicinity of the pool and bathhouse would be stabilized using native vegetation. Dream Lake Dam, which has significantly altered local hydrology on the south slopes of Warner Valley would be removed and the historic stream channels that currently feed the lake would be restored. This could potentially result in a significant increase in riparian and wetland habitat in that area. The overall net effect on wetland resources would be to reduce existing sources of impact to wetland resources within Warner Valley.

Cumulative Impacts

Cumulative impacts on wetlands are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and

draining of Drakesbad Meadow, have resulted in long-term major degradation of wetland resources in Warner Valley. While implementation of the preferred alternative would result in minor adverse effects on wetlands, it would also result in numerous beneficial impacts on wetlands through addressing many of the existing sources of degradation as well as through direct restoration of wetland hydrology and vegetation.

Conclusion

Implementation of the preferred alternative would result in short-term, minor adverse effects on wetlands. However, the preferred alternative would also result in long-term, moderate, beneficial effects on wetlands throughout Warner Valley. There would be a net gain in wetland resources, functions, and values resulting from the preferred alternative and project implementation would serve to substantially reduce the existing impact of wetland resources in the Warner Valley.

Impairment: Under Alternative 2 no wetland resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's wetlands.

Wildlife

Analysis

The long standing development of Warner Valley has resulted in localized degradation of wildlife habitat but a diversity of wildlife species still inhabit the area. Wildlife present within the immediate vicinity of most of the proposed activities are habituated to human activity and adverse effects on these animals as a result of the activities proposed under Alternative 2 are generally expected to be negligible. Removal of Dream Lake Dam could be expected to have a local, short-term effect on the beaver, bufflehead, and other species that inhabit the lake. However, other suitable nearby habitat is present in Hot Springs Creek, upstream from Dream Lake Dam, and in other nearby lakes. Therefore, effects on the local wildlife populations would be minor.

Work in and around particularly sensitive habitat for wildlife, such as the willow and alder riparian thickets along Hot Springs Creek and in Drakesbad Meadow would be timed to avoid nesting and dispersal periods for riparian associated birds or only conducted after surveys prove these species to be absent. Implementation of Alternative 2 will, therefore, not threaten the continued existence of any wildlife species. Under Alternative 2 localized, minor, adverse effects on wildlife would continue in developed areas throughout Warner Valley, along trails, in and around campgrounds, and in and around existing and proposed facilities at Drakesbad Guest Ranch. Restoration and enhancement of habitat in the meadow/fen complex and in currently degraded areas that are to be decommissioned would result in long-term, beneficial impacts on wildlife.

Cumulative Impacts

Cumulative impacts on wildlife are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have resulted in local, long-term, minor to moderate effects on wildlife resources in Warner Valley, primarily through degradation of habitat.

Conclusion

Under Alternative 2 impacts to wildlife could result from construction of new facilities and other proposed activities and this would result in, short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley. In addition restoration and enhancement of currently degraded habitat would constitute a long-term, minor to moderate, beneficial, effect on wildlife.

Impairment: Under Alternative 2 no wildlife resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's wildlife resources.

Special-status Species

Analysis

Other than several species of bats, as described under Alternative 1, special-status wildlife are generally not expected to occur within most developed areas of Warner Valley due to the relatively high levels of habitat disturbance and human use. In general, construction of new facilities are expected to result in only negligible to minor adverse effects on special-status wildlife. However, several special-status bird species are known to use riparian habitat along Hot Springs Creek and in Drakesbad Meadow and construction in these areas could have short-term, minor to moderate, adverse effects on these species. Most of the special-status plants with potential to occur in the project area are found in wetlands, wet meadows, or along creeks and if present near existing facilities or the locations of proposed facilities, these species may be subject to local, minor, adverse effects resulting from construction, although every effort would be made to minimize such impacts. None of these impacts would jeopardize the continued existence of any special-status species and the potential beneficial effects on special-status species resulting from habitat enhancement and restoration that are a part of the project would be long-term and beneficial.

Cumulative Impacts

Cumulative impacts on special-status species are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, as described under Alternative 1, undoubtedly resulted in local,

long-term, moderate adverse effects on special-status plants and wildlife in Warner Valley, primarily through habitat degradation. Under Alternative 2, long-term, minor, adverse effects on special-status species could continue in developed areas throughout Warner Valley, along trails, in and around campgrounds, and in and around existing facilities at Drakesbad Guest Ranch. Additional short-term, minor, adverse impacts could occur as a result of construction of new facilities, rebuilding roads and trails, decommissioning outmoded facilities, and as a result of the Dream Lake Dam removal.

Conclusion

Under Alternative 2, impacts to special-status species would result in local, short-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species. In addition, enhancement and restoration of habitat as a part of Alternative 2, could potentially result in long-term, minor to moderate, beneficial effects on special-status wildlife by increasing the extent of quality habitat and relocating certain facilities further away from sensitive resources.

Impairment: Under Alternative 2 no natural resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's special-status wildlife or plant populations.

Analysis of Environmental Consequences – Alternative 3

Alternative 3 proposes many of the same improvements as Alternative 2. There are, however, several differences under Alternative 3 with potential relevance for biological and wetland resources. These include the construction of a new corral for horses and maintenance of the upper existing horse corral as a staging area for horseback rides; the reconstruction, rather than removal of Dream Lake dam; the use of sheet metal dams in the drainage ditches, rather than filling them, to restore sheet flow in Drakesbad Meadow. The Warner Valley Road improvements widen the blind curve, and follow the actions identified in the culvert inventory. The existing day use parking area and lower campground would be eliminated.

Vegetation

Analysis

Implementation of Alternative 3 would result in tree and vegetation removal in association with the Dream Lake Dam reconstruction, relocation of existing facilities, construction of the new concessioner housing and service center and the utility lines to serve them, new trails, and access roads. These would be considered local, minor, adverse effects on vegetation. Under Alternative 3 the horse corrals would remain in their current location but use of the lower corral would be discontinued and the upper corral would be used only for staging and a bio-filtration system would be added to mitigate the effects of effluent on natural habitat "downstream" of the corral.

A new corral would be built to house the horses away from sensitive meadow habitat in an area already degraded as habitat by proximity to other existing uses. The existing day use parking area would be relocated from the meadow to the existing lower campground and the lower campground would be closed. Relocation of the employee housing and minor facilities would be followed by restoration of currently degraded areas to a natural condition. These are each considered local, long-term minor beneficial effects on vegetation. Implementation of Alternative 3 would thus result in a net negligible effect on vegetation and would not impact vegetative resources within the Warner Valley.

Cumulative Impacts

Cumulative impacts to vegetation resources are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, development of the resort, and draining of the meadow, have resulted in long-term moderate degradation of vegetative resources in Warner Valley. Under Alternative 3 localized minor adverse effects on vegetation occur in conjunction with construction of new facilities, trails and roads. In addition, some of the proposed actions under Alternative 3 are intended to address existing sources of degradation by moving facilities away from sensitive habitat and active restoration of multiple areas that are currently degraded. In the future, fire management activities such as prescribed burns and mechanical thinning projects would occur.

Conclusion

Activities associated with Alternative 3 would result in long-term, minor, adverse effects on vegetation. However, these impacts would be primarily localized and, while individual trees or small areas of vegetation might be removed or otherwise degraded, the effect would not be considered severe within the context of vegetative resources throughout the Valley. Additionally, some of the activities themselves are intended to repair existing degradation of vegetative resources. Therefore, the net effects of Alternative 3 should be a long-term, minor, beneficial effect on vegetative resources and values.

Impairment: Under Alternative 3 no vegetative resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's vegetative resources.

Wetlands

Analysis

As under Alternative 2, Alternative 3 would replace undersized culverts along Warner Valley Road and the day use parking area would be relocated and the wetland that it impinges on would be restored. The proposed actions under Alternative 3 have been designed to avoid and minimize potential impacts to wetlands. Replacement of culverts along Warner Valley Road would result in temporary, short-term adverse impacts to wetlands and riparian vegetation where they are present

in the streams near the road. Construction of new facilities and improvements to existing facilities under Alternative 3 have been designed to avoid and minimize potential impacts to wetlands. Existing impacts on wetland resources in Warner Valley would be addressed to some extent under Alternative 3. Hydrology would be enhanced by adding culverts to the water tank access road at the ranger station as well as to trails crossing the meadow and additional metal check dams would be installed in the drainage ditches to increase water retention and surface sheet flow. The eroding banks of Hot Springs Creek in the vicinity of the pool and bathhouse would be stabilized using native vegetation. Dream Lake Dam, which has significantly altered local hydrology on the south slopes of Warner Valley would be replaced rather than removed. The overall net effect on wetland resources under Alternative 3 would be minor, long-term, and beneficial and would serve to reduce to some extent, but would not fully address, existing impacts of wetland resources within Warner Valley.

Cumulative Impacts

Cumulative impacts on wetlands are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have resulted in long-term major degradation of wetland resources in Warner Valley. While implementation of the preferred alternative would result in minor adverse effects on wetlands, it would also result in beneficial impacts on wetlands by addressing some of the existing sources of degradation as well as through direct restoration of wetland hydrology and vegetation.

Conclusion

Implementation of Alternative 3 would result in long-term, minor, adverse effects on wetlands. However, this alternative would also result in long-term, minor to moderate, beneficial effects on wetlands in Warner Valley. There would be a small net gain in wetland resources, functions, and values resulting from the Alternative 3.

Impairment: Under Alternative 3 no wetland resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's wetlands.

Wildlife

Analysis

The long standing development of Warner Valley has resulted in localized degradation of wildlife habitat but a diversity of wildlife species still inhabit the area. Wildlife present within the immediate vicinity of most of the proposed activities are habituated to human activity and adverse effects on these animals as a result of the activities proposed under Alternative 3 are generally expected to be negligible. Reconstruction of Dream Lake Dam could be expected to have a local, short-term adverse effect on the beaver, bufflehead, and other species that inhabit the lake.

However, there exists other suitable nearby habitat in Hot Springs Creek, upstream from Dream Lake, and in other nearby lakes for these species and the Lake would remain after dam reconstruction so this habitat would once again be available to the wildlife that use it. Therefore, adverse effects on the local wildlife populations would be considered minor. Work in and around sensitive habitat for wildlife, such as the willow and alder riparian thickets along Hot Springs Creek and in Drakesbad Meadow would be timed to avoid nesting and dispersal periods for riparian associated birds or only conducted after surveys prove these species to be absent. Implementation of Alternative 3 will, therefore, not threaten the continued existence of any wildlife species.

Cumulative Impacts

Cumulative impacts on wildlife are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses, including grazing, resort development, road and dam building, and draining of Drakesbad Meadow, have resulted in local, long-term, minor to moderate effects on wildlife resources in Warner Valley, primarily through degradation of habitat. Under Alternative 3, long-term, minor, adverse effects on wildlife would continue in developed areas throughout Warner Valley, along trails, in and around campgrounds, and in and around existing and proposed facilities at Drakesbad Guest Ranch.

Conclusion

Under Alternative 3, impacts to wildlife could result from construction of new facilities and other proposed activities and this would result in local, short-term, minor, adverse effects. However, these impacts would be primarily localized and, while individual animals might occasionally be killed on the road or suffer reproductive failure due to human disturbance, this would be within the natural range of variability of native species' populations and the effect would not be considered severe within the context of wildlife resources throughout Warner Valley. In addition restoration and enhancement of currently degraded habitat would constitute a minor, beneficial effect on wildlife.

Impairment: Under Alternative 3 no wildlife resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's wildlife resources.

Special-status Species

Analysis

Other than several species of bats, as described previously, special-status wildlife are generally not expected to occur within most developed areas of Warner Valley due to the relatively high levels of habitat disturbance and human use. In general, construction of new facilities are expected to result in only negligible to minor adverse effects on special-status wildlife. However, several special-status bird species are known to use riparian habitat along Hot Springs Creek and

in Drakesbad Meadow. Most of the special-status plants with potential to occur in the project area are found in wetlands, wet meadows, or along creeks and if present near existing facilities or the locations of proposed facilities, these species may be subject to construction related impacts. None of these impacts would jeopardize the continued existence of any special-status species and the potential beneficial effects on special-status species resulting from habitat enhancement and restoration that are a part of the project would be long-term and beneficial.

Cumulative Impacts

Cumulative impacts on special-status species are based on analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects of this alternative. Past land uses undoubtedly resulted in local, long-term, moderate adverse effects on special-status plants and wildlife in Warner Valley, primarily through habitat degradation. Under Alternative 3 localized, minor, adverse effects on special-status species could continue in developed areas throughout Warner Valley, along trails, in and around campgrounds, and in and around existing facilities at Drakesbad Guest Ranch. Additional local, minor, adverse impacts could occur as a result of construction of new facilities, rebuilding roads and trails, decommissioning outmoded facilities, and as a result of the Dream Lake Dam reconstruction. Cumulatively, these effects would not result in further impacts to special-status species within Warner Valley and may result in a net long-term, minor, beneficial effect through the restoration of wetland and upland habitat in conjunction with other improvements designed to move existing facilities out of or away from sensitive resources.

Conclusion

Under Alternative 3 impacts to special-status species would result in local, short-term, minor, adverse effects. These impacts would be localized and would not jeopardize the continued existence of any species or result in the destruction or adverse modification of critical habitat for any species. In addition, enhancement and restoration of habitat as a part of Alternative 3 could result in long-term, minor, beneficial effects on special-status wildlife by increasing the extent of quality habitat and relocating certain facilities further away from sensitive resources.

Impairment: Under Alternative 3 no special status resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's special-status wildlife or plant populations.

References

Cowardin, Lewis M., et al., 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service.

Patterson, L. and D.J. Cooper, 2005. *Hydrologic Characterization of a Mountain Fen Complex, Drakesbad Meadow, Lassen Volcanic National Park, Cascade Range, California*, Graduate Thesis.

4.4 Soundscapes

Methodology

Context, duration, and intensity together determine the level of impact for an activity. It is usually necessary to evaluate all three factors together to determine the level of noise impact. In some cases an analysis of one or more factors may indicate one impact level, while an analysis of another factor may indicate a different impact level, according to the criteria below. In such cases, best professional judgment based on a documented rationale must be used to determine which impact level best applies to the situation being evaluated.

The methodology used to assess noise impacts in this document is consistent with National Park Service *Management Policies 2006* and *Director's Order #47: Soundscape Preservation and Noise Management*. There is no current noise data collected for the Warner Valley area. In order to approximate impacts to soundscapes, areas of use by visitors were identified in relation to where both construction and operational activities are proposed. Additionally, national literature was used to estimate the average decibel levels of construction activity.

National Park Service *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

The potential for change in soundscapes proposed by the alternatives was evaluated by identifying projected changes in visitor use and experience, and determining whether or how these projected changes would affect the desired soundscapes, to what degree, and for what duration.

Impact intensity	Impact Description
Negligible	Effects to natural sound environment would be at or below the level of detection and such changes would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience or to biological resources.
Minor	Effects to the natural sound environment would be detectable, although the effects would be localized, and would be small and of little consequence to the visitor experience or to biological resources. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate	Effects to the natural sound environment would be readily detectable and largely localized, with small consequences to the visitor experience or to biological resources in the region. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	Effects to the natural sound environment would be obvious and have substantial consequences to the visitor experience or to biological resources in the region. Extensive mitigation measures would be needed to offset any adverse effects and success would not be guaranteed.

Duration:
Short-term – Occurs only during the construction period.
Long-term – Occurs even after the construction period.

Impact intensity	Impact Description
<u>Type:</u>	
<i>Beneficial</i>	– Effects that would improve or increase natural sound environment and/or reduce features that impede natural sounds and visitor use and/or experience in the project area.
<i>Adverse</i>	– Effects that would degrade or reduce natural sound environment and/or increase features that impede natural sound environment and visitor use and/or experience in the project area.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Soundscapes

Analysis

Under Alternative 1, none of the facilities of the proposed project would be implemented. The existing conditions at Warner Valley include a few facilities that are currently disruptive due to the noise they produce. The filter house located next to the pool and the generator near the dining hall are both noisy and detract from visitors' experience. Under this alternative, noise impacts from construction would not occur.

Cumulative Impacts

Cumulative effects to soundscapes discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. The No Action Alternative will maintain the existing soundscape. In the future, there are no plans that are likely to significantly alter the soundscape. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 1 would result in no new impacts to existing conditions. Therefore, Alternative 1 would have a long-term, minor, adverse impact given that Warner Valley has a greater impact under existing conditions on soundscapes than is currently desired by NPS (Eagan, 2009).

Impairment: Under Alternative 1 no soundscape specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's soundscape.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Soundscapes

Analysis

Under Alternative 2, there would be a significant difference between operational noise impacts and construction related noise impacts.

Construction Impacts

Construction activities associated with Alternative 2 include construction of new buildings, laying of concrete, insertion of boulders into the ground, and grading. The effect of construction noise would depend upon the type of construction activity, the distance between construction activities and the nearest noise sensitive uses, and the existing noise levels at those uses. Typical noise levels generated by different types of standard construction equipment at 50ft (dBA, Leq) are described below in **Table 4.4-1** (FTA, 2006).

**TABLE 4.4-1
STANDARD CONSTRUCTION EQUIPMENT
NOISE LEVELS 50 FEET FROM SOURCE (DBA, LEQ)**

Backhoes	80	Pile drivers (Impact)	101
Compactor	82	Pumps	76
Dozers	85	Scrapers	89
Generators	81	Shovel	82
Jack hammers	88	Truck	88
Paver	89		

Construction will occur throughout the Warner Valley. However, some activities will be occurring farther from visitor areas than others. For example, the dam removal will occur approximately ¼ mile from the Drakesbad Guest Ranch facilities and will have minor noise impacts. However, the construction of new concessioner house and the service center adjacent to the existing guest housing would have greater soundscape impacts. Seasonal access restrictions also require construction to be concurrent with peak visitor season (June to October). Construction will occur in the period over the course of one or two years.

Operational Impacts

Noise from park operations is and will continue to be minimal. There are proposed changes in each area of Warner Valley that will affect soundscapes at the project site. These impacts are discussed below according to which area of the park they will take place.

Campground, Trail, and Day Use Parking. Alternative 2 would close the lower campground and relocate five campsites to the Upper Campground. As a result noise associated with visitor activities will be more concentrated in the Upper Campground area.

Additionally, the existing day use area, including the rock road base and access road, would be restored to a natural meadow/wetland and a parking area with 20 new parking spaces will be constructed. Restoring this area will enhance the natural soundscape it this part of the park. However, the addition of the parking area will likely eliminate any net beneficial impact that the restoration might have had on natural soundscapes.

Drakesbad Guest Ranch. Alternative 2 would construct a new service center outside the historic district with staff housing provided in tent cabins. The service center includes employee housing, gravel road and parking, 13 employee parking stalls, enclosed storage, and new locations for the generator, dumpster and propane tanks. The new employee housing will be relocated from above the dining hall and bunk house to 10 free-standing tent cabins that will surround a common bath house and outdoor social space. This relocation will further disperse noise associated with the peak season. The generator, dumpster, and propane tanks would be relocated from adjacent to the Drakesbad Guest Ranch dining hall to the new service area. This would concentrate noise associated with maintenance activities, minimize ambient noise generated by the equipment, and create distance between the equipment's noise and the visitors. Additionally, noise output from the new generator would be less than the existing generator. Also the bath house is being redesigned to eliminate the need for propane delivery to the pool thus reducing disturbance of natural soundscapes and the volleyball court is being eliminated and the area will be restored.

Dream Lake Dam. Alternative 2 would re-naturalize the meadow area through restoration of the fen, removal of the dam at Dream Lake and the creation of a channel network. This could potentially improve the health of frog populations and thereby enhance the natural soundscapes experienced by Warner Valley visitors.

Cumulative Impacts

Cumulative effects to soundscapes discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Actions taken since 1952 have led to perceivable negative changes to the period of significance (Sifford era) atmosphere. These changes occurred gradually enough that visitors either did not notice or the soundscapes were not affected. Proposed changes will occur in a shorter time frame so visitors will notice, but may view them as beneficial. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 2 would have short-term, major, adverse impacts but long-term, minor, beneficial impacts.

Impairment: Under Alternative 2 no soundscapes specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's soundscape.

Analysis of Environmental Consequences – Alternative 3

Soundscapes

Analysis

Like Alternative 2, under Alternative 3, there would be a significant difference between operational noise impacts and construction related noise impacts.

Construction Impacts

Similarly to Alternative 2, construction activities associated with Alternative 3 include construction of new buildings, laying of concrete, grading, and paving. The effect of construction noise would depend upon the type of construction activity, the distance between construction activities and the nearest noise sensitive uses, and the existing noise levels at those uses. Typical noise levels generated by different types of standard construction equipment at 50ft (dBA, Leq) are described in Table 4.4-1.

Construction will occur throughout the Warner Valley area although some activities will be occurring farther from visitors. For example, the dam reconstruction will occur approximately ¼ mile from the Drakesbad Guest Ranch facilities and will have minor noise impacts. However, the construction of new concessioner housing and the service center adjacent to the existing guest housing would have discernable impacts. Seasonal access restrictions also require construction to be concurrent with peak visitor season (June to October). Construction will occur in the period over the course of one or two years.

Operational Impacts

Noise from park operations is and will continue to be minimal. There are proposed changes in each area of Warner Valley that will affect soundscapes at the project site. These impacts are discussed below according to which area of the park they will take place.

Campground, Trail, and Day Use Parking. Alternative 3 would close the lower campground and relocate the day use parking and trailhead to this location. The existing Day Use Area would be completely restored as analyzed under Alternative 2. Restoring this area will enhance the natural soundscape in this part of the park. However, the addition of the parking area will likely eliminate any net beneficial impact that the restoration might have had on natural soundscapes.

Drakesbad Guest Ranch. This Alternative proposes a new, two-story employee housing facility outside of the historic district. This facility would also include enclosed storage for the bone yard and a hybrid power system including photovoltaic panels and a diesel generator. The existing generator, dumpster, propane tanks would also be relocated to the new service area. Noise generated by all of these sources would be concentrated and placed farther from the park visitors thus reducing the disruption of natural soundscapes.

Dream Lake Dam. This alternative proposes to reconstruct the existing Dream Lake Dam to meet Bureau of Reclamation Standards. This would not have an impact on the long-term soundscapes in Warner Valley.

Cumulative Impacts

Cumulative effects to soundscapes discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Actions taken since 1952 have led to perceivable negative changes to the period of significance (Sifford era) atmosphere. These changes occurred gradually enough that visitors either did not notice or the soundscapes were not affected. Proposed changes will occur in a shorter time frame so visitors will notice, but may view them as beneficial. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 3 would have short-term, moderate, adverse impacts but long-term, minor, beneficial impacts.

Impairment: Under Alternative 3 no soundscapes specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's soundscape.

References

Federal Transit Administration (FTA), 2006. *Guidance Manual Transit Noise and Vibration Impact Assessment*.

Eagan, Sean, Personal communication, March, 2009

4.5 Cultural Resources

Methodology

The assessment of impacts on cultural resources and historic properties was made in accordance with regulations of the Advisory Council on Historic Preservation (36 CFR 800) implementing Section 106 of the National Historic Preservation Act. Following a determination of the areas of potential effect, cultural resources were identified within these areas that are either listed in, or eligible for listing in, the National Register of Historic Places. An assessment was made of the nature and extent of effects on cultural resources anticipated from implementing proposed undertakings. Cultural resources can be affected by actions that alter in any way the attributes that qualify the resources for inclusion in the National Register. Adverse effects can result when the integrity of a resource's significant characteristics is diminished. Consideration was given both to the effects anticipated at the time and place of the undertaking, and to those potentially occurring indirectly at a later time and distance. Analysis took into account recommendations from the National Park Service's *Cultural Landscape Report for Drakesbad Guest Ranch*.

To provide consistency with requirements of the National Environmental Policy Act (NEPA), the effects on cultural resources are also described in terminology intended to convey the duration, intensity, and beneficial or adverse nature of potential impacts. Impacts could be of short-term, long-term, or permanent duration (Analysis of the duration of impacts is required under NEPA; however, duration is not required and is not usually considered in assessing effects in terms of the National Historic Preservation Act). The intensity of impacts is defined below.

Impact intensity	Impact Description
Negligible	When the impact is barely perceptible and not measurable. Significant character-defining attributes of historic properties (including the informational potential of archaeological resources) are not appreciably diminished by the undertaking;
Minor	When the impact is perceptible and measurable. The effects remain localized and confined to a single element contributing to the significance of a larger national register property/district, or archaeological site(s) with low to moderate data potential;
Moderate	When the impact is sufficient to alter character-defining features or historic properties, generally involving a single or small group of contributing elements, or archaeological site(s) with moderate to high data potential; or
Major	When the impact results in a substantial and highly noticeable change in character-defining features of historic properties, generally involving a large group of contributing elements and/or individually significant property, or archaeological site(s) with high to exceptional data potential.

Context:

Localized – Detectable only in the vicinity of the proposed action

Duration:

Short-term – Occurs only during the treatment action.

Long-term – Occurs after the treatment action.

Type:

Beneficial – Effects that would improve or increase character-defining features or historic properties or would reduce features that impede character-defining features or historic properties in the project area.

Adverse – Effects that would degrade or reduce character-defining features or historic properties or would increase features that impede character-defining features or historic properties in the project area

Analysis of Environmental Consequences – Alternative 1 (No Action)

Alternative 1 proposes no action, which assumes that no substantive changes will be made to the area. Under this alternative, Drakesbad Guest Ranch would remain unchanged and small scale features would remain in their present locations and conditions, and the bathhouse, pool, and circulation facilities remain unchanged.

Archaeological Resources

Analysis

Under Alternative 1 there would be no change in the existing conditions and hence no alteration of the existing treatment and management plan for archaeological resources in the Warner Valley area. While the park would continue to protect and maintain all known archaeological sites, minor degradation of archaeological sites could occur due to visitor use, routine maintenance and repairs, and natural processes. Potential impacts include loss of information, and alterations of the integrity of archaeological sites. In 2000, an archaeological investigation was completed for the Drakesbad Guest Ranch area by the Archaeological Research Program, Department of Anthropology, California State University, Chico (White, 2001). Thirty-three isolated archaeological finds were recorded and 36 archaeological sites were studied, 20 of which represented previously recorded resources. Archaeological resources are present throughout Warner Valley, particularly within the day use area, the Warner Valley campground area, and the Drakesbad Guest Ranch area.

Cumulative Impacts

Cumulative impacts to archaeological resources are based on the analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with potential effects associated with this alternative. Humans have used this site for 4,000 years and each group has had some impact on the archaeology resources of the culture that came before. The Sifford family and later the NPS have consistently inflicted change to the facilities, thus impacting at some level archaeological resources during the last 100 years. In particular, Sifford managed the area by making changes during the period of significance and therefore, to some extent, a level of change is appropriate within this area (Sifford, 1994). In addition, as time goes on, these resources could be subject to damage from new construction, demolition, rehabilitation of existing facilities and utility corridors, the restoration of the natural environment, vandalism, visitor access, and natural processes. In the future, while no other major construction is envisioned in the surrounding five miles, if visitors are encouraged to recreate here, some low level of impact will continue to occur regardless of the chosen alternative. Data loss and minor degradation of site integrity could continue for archaeological resources currently located in areas frequented by park visitors, in areas impacted by natural erosional processes or by past park development. However, no heavy equipment will disturb the area and the current level of disturbance is on a similar order of magnitude as earlier cultures' disturbance.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of the no action alternative has an adverse effect on archaeological resources due to visitor use of or interaction with areas where archaeological resources have been identified, unregulated vehicular parking, pedestrian foot traffic, as well as the degradation of archaeological resource site integrity from erosion and natural processes.

Conclusion

The no action alternative would result in a long-term, minor, adverse impact on archaeological resources. The impact of this alternative on archaeological resources would be primarily localized and the effect would not be considered severe.

Impairment: Under Alternative 1, no archaeological resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's archaeological resources.

Cultural Landscape Resources

Analysis

Under Alternative 1, minor degradation of the Nationally Registered Drakesbad Guest Ranch could occur due to visitor use, routine maintenance and repairs, as well as natural processes. The park would continue to maintain and restore the historic structures when feasible. Potential impacts include minor changes to the landscape due to natural processes and the continued clutter and accumulation of noncontributing features to the historic district. Visitor experience would be diminished due to the presence of park facilities in the cultural landscape setting of the Drakesbad Guest Ranch.

Cumulative Impacts

With the implementation of Alternative 1, the Drakesbad Guest Ranch cultural resource could be subject to minor impact caused by visitor use, routine maintenance and repairs, and natural processes. Data loss and continued degradation of resource integrity could continue in areas frequented by park visitors and an impacted visitor experience due to the existing placement of park facilities and services in locations that detract from the historical setting of the cultural landscape. Potential impacts to the cultural landscape and setting include adverse effects resulting from the continued unregulated parking of motor vehicles by park visitors, the alteration of the visual landscape by the existing placement of garbage collection points, propane tank locations, service facility locations, the volleyball court and employee housing.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of

Alternative 1 has an adverse effect due to visitor use, the unregulated parking of motor vehicles by park visitors, and the alteration of the visual landscape and setting of the landscape by routine maintenance and repairs of visitor and park facilities.

Conclusion

Impacts on cultural landscape resources would result in a long-term, minor, adverse impact due to potential minor degradation of the Drakesbad Guest Ranch cultural landscape. The impact of this alternative on cultural landscape resources would be primarily localized and the effect would not be considered severe.

Impairment: Under Alternative 1, no cultural resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's cultural landscape resources.

Analysis of Environmental Consequences – Alternative 2 (Preferred)

Alternative 2 proposes to relocate the fee station to a new area west of the historic ranger station and make improvements to parking and pull-out areas near the new fee station. A new service road would be constructed and Warner Valley Road would be restored. The existing day use parking area would be relocated to the lower campground. Various campground improvement projects are proposed for the upper campground. Within Drakesbad Guest Ranch, employee housing will be relocated outside of the historic district, combined with added facilities. The current bathhouse and pool will be renovated and parking areas within Drakesbad Guest Ranch will be redesigned. Also under this alternative, Drakesbad Meadow will be returned to its natural fen ecology through the filling of man-made features and the dam for Dream Lake would be removed, also returning this area to its natural condition.

Archaeological Resources

Analysis

Several archaeological resources that are vulnerable to adverse impact have been identified within areas subjected to proposed actions related to Alternative 2 (White, 2001). In particular, archaeological resources identified by G. White in the ranger station area, the Warner Valley campground area, the day use area, the central Drakesbad area, upper Drakesbad area, and the Dream Lake Dam area, are at risk. Likewise, the possibility exists for the inadvertent discovery and impacts to previously unidentified archaeological resources encountered during the implementation of proposed alternative activities. Under Alternative 2, the park would continue to protect and maintain all known archaeological sites. Degradation of archaeological sites could occur due to grading, trenching, clearing, road construction, the restoration of Drakesbad Meadow and Dream Lake to a natural environment, as well as other proposed activities. In 2000, an archaeological investigation was completed for the Drakesbad Guest Ranch area by the Archaeological Research Program, Department of Anthropology, California State University, Chico (White, 2001).

Thirty-three isolated archaeological finds were recorded and 36 archaeological sites were studied, 20 of which represented previously recorded resources. The documented prehistoric and historic-period presence in the Warner Valley and Drakesbad Guest Ranch areas indicates an increased likelihood for the discovery of archaeological resources. Without mitigation, these resources could be subject to damage and loss of information. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11).

Cumulative Impacts

Cumulative impacts to archaeological resources are based on the analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with the potential effects of this alternative. Humans have used this site for 4,000 years and each group has had some impact on the archaeology resources of the culture that came before. The Sifford family and later the NPS have consistently inflicted change to the facilities, thus impacting at some level archaeological resources during the last 100 years. In particular, Sifford managed the area by making changes during the period of significance and therefore, to some extent, a level of change is appropriate within this area. The actions considered in this alternative will be less damaging than what has happened in the past 100 years because the NPS currently considers the full cultural landscape in its planning process and has mitigation in place to protect resources. However, these resources could be subject to damage from, new construction, demolition, rehabilitation of existing facilities and utility corridors, the restoration of the natural environment, vandalism, visitor access, and natural processes. In the future, while no other major construction is envisioned in the surrounding five miles, if visitors are encouraged to recreate here, some low level of impact will continue to occur regardless of the chosen alternative.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of Alternative 2 has the slight potential to effect archaeological resources. Recognizing this potential, NPS will do site by site archaeological effects analyses to comply with NHPA prior to the commencement of any ground disturbing activities.

Conclusion

Impacts on archaeological resources with the implementation of Alternative 2 would result in a long-term, minor, adverse impact due to damage from new construction, demolition, rehabilitation of existing facilities and utility corridors, visitor access, and natural processes. Such potential impacts would include deposits, loss of information, and changes in the integrity of archaeological sites. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11, Mitigation Measures).

Impairment: Under Alternative 2 no archeological resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource value highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's archaeological resources.

Cultural Landscape Resources

Analysis

Major adverse impacts to cultural landscape resources include the loss of contributing resources within the Drakesbad Guest Ranch Historic District through the removal of Dream Lake Dam and the draining of Dream Lake (contributing structure).

Moderate adverse impacts to the historic district include the addition of new structures and circulation features, road construction, changes in existing use (the corral) additions or modifications to the exteriors of historic structures (redeveloped/new surfacing for outdoor dining area) and construction of new structures (pole barn and new infrastructure) within the historic building complex.

The ecological restoration of Drakesbad Meadow is a moderate adverse impact, conditional on the implementation of a vegetation management plan to maintain historic character and historic views. Vegetation shall be managed consistent with the recommendations in the CLR, including maintaining the historically open character of the meadow as a contributing resource to the historic district.

Beneficial impacts to the cultural landscape include the relocation of park operation and administrative facilities and employee housing outside of the historic district, the rehabilitation of circulation through the meadow (reducing the footprint of the road to the pool and adding drainage technologies to the new trail), and the relocation of non-contributing small-scale features including the volleyball court and garbage receptacles to locations outside of the Drakesbad Guest Ranch Historic District.

Cumulative Impacts

Cumulative impacts to cultural landscape resources are based on the analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with the potential effects of this alternative. A series of actions during the last 50 years have had a moderate affect on the integrity of the historic district including the siting of temporary structures (trailers), undefined parking for automobiles, and the random placement of several small-scale features within the district including trash cans, propane tanks, and numerous directional and safety signs. Dream Lake Dam has breached twice in the past. Complete removal of the dam is much more significant than unintentional breaches that were quickly plugged.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of Alternative 2 has an adverse effect on the Drakesbad Guest Ranch Historic District.

Conclusion

Impacts on cultural landscape resources that would result in a long-term, major, adverse impact include the removal of Dream Lake Dam (a contributing resource to the Drakesbad Guest Ranch Historic District). In addition, proposed changes in circulation, the addition of new structures, and changes in land use while individually only minor, may be aggregated to create a greater effect. Beneficial effects include the removal of non-historic NPS operations and administrative functions to an area outside the historic district, and the improvement of circulation through the meadow. Collectively, these proposed activities could diminish cultural landscape resources or diminish the integrity of the National Register district.

Impairment: Under Alternative 2 no cultural resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's cultural landscape resources.

Analysis of Environmental Consequences – Alternative 3

Alternative 3 proposes many of the same improvements as Alternative 2; some of the differences include the relocation of the horse corral to an off-site location, the replacement of the Dream Lake Dam, the restoration of Drakesbad Meadow to its original fen ecology by damming the human-made ditches with sheet metal so they no longer dewater the meadow, and the widening of the blind curve on Warner Valley Road and the addition of a drainage ditch, as well as other auxiliary road and facility improvements.

Archaeological Resources

Analysis

Under Alternative 3, the park would continue to protect and maintain all known archaeological sites, however, construction activities could degrade archaeological sites from grading, trenching, clearing, road construction, and other ground-disturbing activities. In 2000, an archaeological investigation was completed for the Drakesbad Guest Ranch area by the Archaeological Research Program, Department of Anthropology, California State University, Chico (White, 2001). Thirty-three isolated archaeological finds were recorded and 36 archaeological sites were studied, 20 of which represented previously recorded resources. The documented prehistoric and historic-period presence in the Warner Valley and Drakesbad Guest Ranch areas indicates an increased likelihood for adverse impact to archaeological resources. In particular, archaeological resources identified by G. White in the Ranger Station area, the Warner Valley campground area, the day use area, the Central Drakesbad area, Upper Drakesbad area, and the Dream Lake Dam area, are at risk. Such archaeological resources could be subject to damage and loss of information by proposed actions associated with this alternative. Disturbance of archaeological sites could result in a permanent, irreversible loss of the integrity of individual sites, and therefore, the impact to archaeological resources would be a local, long-term, minor, adverse impact. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11).

Cumulative Impacts

Cumulative impacts to archaeological resources are based on the analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with the potential effects of this alternative. Humans have used this site for 4,000 years and each group has had some impact on the archaeology resources of the culture that came before. The Sifford family and later the NPS have consistently inflicted change to the facilities, thus impacting at some level archaeological resources during the last 100 years. In particular, Sifford managed the area by making changes during the period of significance and therefore, to some extent, a level of change is appropriate within this area. The actions considered in this alternative will be less damaging than what has happened in the past 100 years because the NPS currently considers the full cultural landscape in its planning process and has mitigation in place to protect resources. However, these resources could be subject to damage from, new construction, demolition, rehabilitation of existing facilities and utility corridors, the restoration of the natural environment, vandalism, visitor access, and natural processes. Dream Lake Dam has breached twice in the past. In the future, while no other major construction is envisioned in the surrounding five miles, if visitors are encouraged to recreate here, some low level of impact will continue to occur regardless of the chosen alternative.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of Alternative 3 has the slight potential to effect archaeological resources. Recognizing this potential, NPS will do site by site archaeological effects analyses to comply with NHPA prior to the commencement of any ground disturbing activities.

Conclusion

Impacts on archaeological resources with the implementation of Alternative 3 would result in a long-term, minor, adverse impact due to damage from new construction, demolition, rehabilitation of existing facilities and utility corridors, visitor access, and natural processes. Such potential impacts would include deposits, loss of information, and changes in the integrity of archaeological sites. National Park Service standard mitigation procedures will be followed to address these impacts (see Section 4.11, Mitigation Measures).

Impairment: Under Alternative 3 no archaeological resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource value highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's archaeological resources.

Cultural Landscape Resources

Analysis

Moderate adverse impacts to the cultural landscape include alterations to the cultural landscape, construction of a new dam to the Bureau of Reclamation Standards; new road construction,

expansion of existing structures and park facilities, and construction of new structures and facilities. The restoration of Drakesbad Meadow is a moderate adverse impact, conditional on the implementation of a vegetation management plan to maintain the three historic views. Vegetation shall be managed consistent with the CLR recommendations, including maintaining the historically open character of the meadow as a contributing resource to the historic district.

Beneficial impacts to the cultural landscape include the relocation of park administrative and operational facilities outside the historic district, relocation of employee housing, and the relocation of small scale features such as garbage receptacles outside the historic district. Rebuilding Dream Lake Dam will give the facility a 100 year plus lifespan thereby giving permanence to a contributing feature that is likely to fail if no action were taken. Collectively, these impacts may create long-term beneficial impacts associated with visitor experience of the Drakesbad Guest Ranch Historic District.

Cumulative Impacts

Cumulative impacts to cultural landscape resources are based on the analysis of past, present, and reasonably foreseeable future actions in Warner Valley, in combination with the potential effects of this alternative. A series of actions during the last 50 years, have degraded the historic landscape (trailers, trash cans, propane tanks, and inappropriate buildings). Drakesbad Meadow would be converted back into a fen, which was in existence at the start of the period of significance.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of Alternative 3 would have a potentially beneficial effect on cultural landscape resources located in Warner Valley. While unidentified resources could be impacted, many actions in the vicinity of the lodge will be beneficial from a cultural standpoint and rebuilding Dream Lake Dam will give the facility a 100 year plus lifespan thereby giving permanence to a contributing feature that is likely to fail if no action were taken.

Conclusion

Impacts on the Drakesbad Guest Ranch cultural landscape by actions relating to Alternative 3 would result in a long-term, moderate, beneficial impact due to the enhancement of the cultural landscape by the proposed rebuilding of Dream Lake Dam as a contributory feature to the Nationally Registered Drakesbad Guest Ranch property. Alternative 3 could impact or diminish cultural landscape resources or values.

Impairment: Under Alternative 3 no cultural resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's cultural landscape resources.

References

National Park Service (NPS), 2005. *Cultural Landscape Report for Drakesbad Guest Ranch*.

Sifford, Roy, 1994. *Sixty Years of Siffords at Drakesbad*. Susanville, CA: Lahontan Images.

White, G.G., 2001. *Report of Archaeological, Geoarchaeological, and Palynological Investigations in Lassen Volcanic National Park, California*. Prepared for Lassen Volcanic National Park.

4.6 Visitor Experience

Methodology

Visitor experience, for the purpose of this analysis, refers to the quality and effectiveness of the facilities for the use of visitors. Part of the purpose of the National Park is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the park's management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities. Analysis was based on whether there was a complete loss of a recreational opportunity, a change in access to or availability of a recreational opportunity, or a change in the quality of visitor experience or recreational opportunities. Changes in safety are addressed in Section 4.7, Public Health and Safety.

The potential for change in visitor experience proposed by the alternatives was evaluated by identifying how projected changes may impact the experience of visitors, and determining whether or how these projected changes would affect the desired visitor experience, to what degree, and for what duration.

Impact intensity	Impact Description
Negligible	Changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.
Minor	Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.
Moderate	Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.
Major	Changes in visitor use and/or experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

Duration:
Short-term – Occurs only during the treatment action.
Long-term – Occurs after the treatment action.

Type:
Beneficial – Effects that would improve or increase visitor use opportunities and/or experience or would reduce features that impede visitor use and/or experience in the project area.
Adverse – Effects that would degrade or reduce visitor use opportunities and/or experience or would increase features that impede visitor use and/or experience in the project area.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Visitor Experience

Analysis

Alternative 1 proposes that no change would take place to the existing conditions of Warner Valley. There would be no new impacts to visitor experience under the No Action Alternative. As discussed in Chapter 3, Affected Environment, the Comprehensive Site Plan has identified numerous features within Warner Valley that detract from the visitors' experience due to their existing location. The current arrangement and location of the fee station is considered difficult to use by park visitors. No change to this arrangement will continue the present difficulty for the park user. The location of several park facilities such as the dumpster, propane tanks and site storage ('bone yard') is unsightly and detracts from the visitor's experience of these non-contributing features in the historic district. In addition, the pool filter house located next to the pool deck is noisy and obstructs the view of the creek, while the generator near dining hall is noisy and nearby electrical lines are unsightly. There are numerous areas of the park that are not accessible and therefore do not comply with the Americans with Disabilities Act (ADA) requirements (42 U.S.C. §§ 12101 et seq., 28 CFR Part 35 (Title II, Department of Justice)). The campgrounds are divided by a road and are disorganized. Lastly, the Pacific Crest Trail (PCT) is difficult to follow because it lacks clear trail connections and signage. It becomes disconnected where it crosses Warner Valley Road, causing hikers to travel along the road a short distance before continuing on the trail.

While there are problems with the layout of Warner Valley, it continues to be a popular destination, in particular at Drakesbad Guest Ranch. In the long term, Dream Lake Dam will likely fail and the recreational opportunities related to it will be lost. However, these recreational activities could be replaced with other types of opportunities available in the resulting restored riverine environments.

Cumulative Impacts

Cumulative effects to visitor experience discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. In the past, the Sifford family and the National Park Service have structured the type of recreation that people participate in. The No Action Alternative will maintain the same set of recreation options. In the future, there are no plans that are likely to significantly alter recreational opportunities with the exception of the potential dam failure. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Visitors continue to make this area of the park a destination regardless of the existing design and layout. Some visitors may see the slow decline in facilities as adverse. Therefore, the No Action Alternative would have a long-term, minor, adverse effect.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Visitor Experience

Analysis

The visitor experience would be affected by noise, dust, and fumes from construction equipment in the project area during construction. Visitors would be restricted from parts of the project area for safety reasons during the period of construction. Construction activities would result in a moderate, short-term, adverse effect on the visitor experience. Once construction is complete, the function of the buildings, roadways, and facilities of the park and its accessibility to all visitors would be greatly improved, and provide a moderate, long-term, beneficial effect. The removal of Dream Lake Dam would drain the impoundment that is currently used for lake-based recreation. These activities would still exist at nearby Juniper Lake. The restored riverine system would provide other types of recreation such as fishing as well as the educational opportunity for visitors to learn about the benefits of ecosystem restoration.

Alternative 2 would provide the following benefits to visitors:

- ADA accessible site in the campground, bathhouse, and outdoor dining area
- Safe and user-friendly entry area
- Improvements to the corral
- Relocated features such as the propane tanks, dumpster and generator to the new service area and out of the sight and sound of visitors at Drakesbad Guest Ranch
- Restored natural and historic areas throughout the project area
- Improvements to the campground arrangement
- PCT connectivity throughout Warner Valley

Cumulative Impacts

Cumulative effects to visitor experience discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. In the past, actions since 1952 have led to perceivable negative changes to the period of significance (Sifford era) atmosphere. These changes occurred gradually enough that visitors either did not notice or the visitor experience was not affected. Proposed changes will occur in a shorter time frame so visitors will notice, but may view them as beneficial. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

While the most dramatic change would be the removal of Dream Lake Dam, overall the changes in this alternative would be viewed as beneficial by most visitors. During construction, Alternative 2 would have minor, short-term adverse impacts that would require temporary

mitigation. Post-construction, Alternative 2 would result in long-term, moderate, beneficial impacts on visitor experience.

Analysis of Environmental Consequences – Alternative 3

Visitor Experience

Analysis

The visitor experience would be affected by noise, dust, and fumes from construction equipment in the project area during construction. Visitors would be restricted from parts of the project area for safety reasons during the period of construction. Construction activities would result in a minor, short-term, adverse effect on the visitor experience. Once construction is complete, the function of the buildings, roadways, and facilities of the park and its accessibility to all visitors would be greatly improved, and provide a moderate, long-term, beneficial effect. This alternative would provide the same PCT connectivity as Alternative 2. Under Alternative 3, five campsites will be eliminated when the Day Use Parking area is relocated to the lower campground area, thus reducing the overall number of campsites. The reconstruction of Dream Lake Dam would ensure that existing recreational activities continue to be available on the lake, would continue in the future and would be within walking distance of the rest of the Warner Valley facilities.

Alternative 3 would provide the following benefits to visitors:

- ADA accessible site in the campground, bathhouse, and outdoor dining area
- Safe and user-friendly entry area
- Relocation of the corral
- Relocated features such as the propane tanks, dumpster and generator to the new service area and out of the sight and sound of visitors at Drakesbad Guest Ranch
- Restored natural and historic areas throughout the project area
- Improvements to the campground arrangement
- PCT connectivity throughout Warner Valley

Cumulative Impacts

Cumulative effects to visitor experience discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Actions taken since 1952 have led to perceivable negative changes to the period of significance (Sifford era) atmosphere. These changes occurred gradually enough that visitors either did not notice or the visitor experience was not affected. Proposed changes will occur in a shorter time frame so visitors will notice, but may view them as beneficial. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

The reconstruction of Dream Lake Dam would ensure that recreation at Dream Lake would continue. This, in addition to the other upgrades to the facilities, would result in beneficial changes. Alternative 3 would have minor, short-term adverse impacts during construction, which would require temporary mitigation. Post-construction, Alternative 3 would result in long-term, minor, beneficial impacts on visitor experience.

4.7 Public Health and Safety

Methodology

The potential for change in public health and safety for the visitors and staff proposed by the alternatives was evaluated by identifying projected changes in the infrastructure and new design of Warner Valley in the Site Comprehensive Plan that would protect the health and safety of visitors and staff, and determining whether or how these projected changes would affect the desired public health and safety, to what degree, and for what duration.

Impact intensity	Impact Description
Negligible	Changes in public health and safety would be below or at the level of detection.
Minor	Changes in public health and safety would be detectable, although the changes would be slight. The public may or may not be aware of the effects associated with the alternative, but the effects would be slight.
Moderate	Changes in promoting the health and safety of visitor and/or staff use and/or experience would be readily apparent. The impacts could have an appreciable health and safety effect.
Major	Changes in the health and safety of the visitor or staff experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor and/or staff would be aware of the effects associated with the alternative

Duration:
Short-term – Occurs only during the treatment action.
Long-term – Occurs after the treatment action.

Type:
Beneficial – Effects that would improve or increase public health and safety or would reduce features that impede public health and safety in the project area.
Adverse – Effects that would degrade or reduce public health and safety or would increase features that impede public health and safety in the project area.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Public Health and Safety

Analysis

The no action alternative, or no change in the existing conditions at Warner Valley, would result in a minor, long-term, adverse effect due to the continuation of existing facilities in the park that impact the health and safety of visitors and staff. Without changes to the existing conditions, safety for the guests and park staff will continue to pose a risk. The current location of the fee station presents visitor safety issues and the existing pull-out is adjacent to a dangerous curve. Dust is a concern along the roads and within the lower campground adjacent to the road. There is a lack of ADA-accessible camping. The bathhouse is also not accessible and is in a state of disrepair.

Cumulative Impacts

Cumulative effects to public health and safety discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Warner Valley Road has been a dirt/gravel narrow road for 90 years. Generally, visitors expect this condition and drive at appropriate speeds. In the future there is no plan to pave or widen this road. There is a plan to thin the vegetation to create defensible space adjacent to the road in the event of fire. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Overall, the no-action alternative would have a minor, long-term, adverse impact.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Public Health and Safety

Analysis

Alternative 2 (the preferred alternative) would relocate the fee station to west of the ranger station and provide three off roadway visitor parking spaces. Road dust would be reduced by installing uniform aggregate on the road. The lower campground would be closed permanently and the upper campground would undergo renovations that would include expanding its capacity and adding an accessible campsite. A new section of trail would be added to connect the Pacific Crest Trail (PCT) between the new day use and old day use parking areas. The bathhouse would be expanded and renovated. Utilities mains and services would be extended to the building sites of the concessioner housing and service center. Sewer and domestic water service would connect to the existing mains located in the road. Water service for fire protection would require new hydrants connected to additional water tanks. Sizing of all utilities would be based on demand requirements and hydrologic conditions, which would be determined during detailed design of all improvements. During construction, there is potential for construction-related accidents, as during any construction project.

Cumulative Impacts

Cumulative effects to public health and safety discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Warner Valley Road has been a dirt/gravel narrow road for 90 years. Generally, visitors expect this condition and drive at appropriate speeds. In the future, there is no plan to pave or widen this road. There is a plan to thin the vegetation to create defensible space adjacent to the road in the event of fire. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 2 would result in a long-term, moderate, beneficial effect. However, some hazards on the road will continue. There would be short-term, negligible, adverse effects from construction activity, but this activity would not impact health and safety. Changes will make the area a more accessible place for those with limited mobility and safer for all.

Analysis of Environmental Consequences – Alternative 3

Public Health and Safety

Analysis

The entry area would be reconfigured with the iron ranger moved adjacent to the ranger station. The service road to the water tank would remain, but a chain gate across the entry would divert cars from using it mistakenly. An additional public safety measure includes the widening of the blind curve on the uphill side of Warner Valley Road. All other modifications that would affect public health and safety within the campground, trail and day use parking, concessioner area and service center would be identical to Alternative 2.

Cumulative Impacts

Cumulative effects to public health and safety discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Warner Valley Road has been a dirt/gravel narrow road for 90 years. Generally, visitors expect this condition and drive at appropriate speeds. In the future, there is no plan to pave or widen this road. There is a plan to thin the vegetation to create defensible space adjacent to the road in the event of fire. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 3 would result in a long-term, moderate, beneficial effect. There would be negligible, short-term, adverse effects from construction activity, but would not impact health and safety. Changes will make the area a more accessible place for those with limited mobility and safer for all.

4.8 Transportation

Methodology

The focus of this impact assessment was on the effect of changes to Warner Valley's roadway circulation, parking areas, and facilities on traffic volumes and associated traffic flow and safety conditions. An important consideration for this assessment is that it is expected there would be no increases in visitation levels to Warner Valley. Analysis of effects was qualitative, and professional transportation engineering judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. When possible, mitigation measure(s) were incorporated into the Comprehensive Site Plan to reduce the intensity of adverse effects.

Traffic Flow Conditions

This section assessed potential changes in traffic volumes associated with proposed changes to visitor accommodations and/or parking facilities. Changes in traffic volumes were then judged as to whether they would substantially change the levels of congestion on the roadway system serving Warner Valley.

Traffic Safety/Conflicts

This section assessed proposed changes in roadway alignments and/or parking facilities (location and number of parking spaces) as to their effect on the potential for traffic conflicts.

Impact intensity	Impact Description
Negligible	Effects considered not detectable and would have no discernible effect on traffic flow and/or traffic safety conditions.
Minor	Effects on traffic flow and/or traffic safety conditions that would be slightly detectable, but not expected to have an overall effect on those conditions.
Moderate	Effects that would be clearly detectable and could have an appreciable effect on traffic flow and/or traffic safety conditions.
Major	Effects that would have a substantial, highly noticeable influence on traffic flow and/or traffic safety conditions and could permanently alter those conditions.

Duration:
Short-term – Temporary, associated with transitional types of activities.
Long-term – Permanent effect on traffic flow and/or traffic safety conditions.

Type:
Beneficial – Effects that would improve traffic flow and traffic safety reducing levels of congestion and occurrences of vehicle/vehicle, and vehicle/pedestrian conflicts.
Adverse – Effects that would negatively alter traffic flow and traffic safety by increasing levels of congestion and occurrences of vehicle/vehicle, and vehicle/pedestrian conflicts.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Transportation

Analysis

Traffic Flow Conditions

Under Alternative 1, camping, lodging, parking, and circulation facilities in Warner Valley would remain in their current locations, in their current conditions, and at their current capacities. The number of daily vehicle trips generated by activities at those locations (visitors and employees) would remain the same. Traffic flow conditions on roadways in the Warner Valley area would be the same as described in Chapter 3, Affected Environment. For example, the configuration of the fee station (“iron ranger”) would continue to require visitors to stop their vehicles in the road, or park at the ranger station and walk back 100 feet to access the fee station. Also, the gravel road leading to the water tank for the ranger’s station would continue to create confusion to visitors who mistake it for an access road, and the edge “creep” of parking areas and roads in the Drakesbad Guest Ranch area would continue to create unclear zones for traffic. Warner Valley would continue to have inefficient traffic flow and circulation for those reasons.

Traffic Safety/Conflicts

As stated above, under Alternative 1, the number of daily vehicle trips generated by activities in Warner Valley would remain unchanged, as would the number of parking spaces and the alignment and configuration of roadways serving Warner Valley. Traffic safety conditions in the Warner Valley area would be the same as described in Chapter 3, Affected Environment. For example, the configuration of the fee station would continue to require visitors to stop their vehicles in the road, or park at the ranger station and walk back to access the fee station. In addition, Warner Valley Road would continue to have blind curves (at the fee station and approximately one-half mile past the ranger station). Lastly, the gravel road leading to the water tank for the ranger’s station would continue to confuse visitors who mistake it for an access road, and the edge “creep” of parking areas and roads in the Drakesbad Guest Ranch area would continue to create unclear zones for traffic. Vehicles and pedestrians sharing the road, unclear travel paths for vehicles confusing motorists, and restricted ability for motorists to see other vehicles around blind curves would continue to create traffic safety hazards in the Warner Valley area.

Cumulative Impacts

Cumulative effects to transportation discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

The No-Action Alternative 1 would have a local, long-term, moderate, adverse effect. Continued operations in Warner Valley would cause local, long-term, moderate, adverse impacts to traffic flow and traffic safety conditions due to the unchanged alignment of Warner Valley Road and unchanged circulation patterns.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Transportation

Analysis

Construction-related Transportation Effects

The construction effort for Alternative 2 would have local, short- and long-term adverse transportation impacts. The intensity and nature of the construction activity would vary over the construction period, and the range of adverse impacts to traffic flow and safety conditions would similarly vary. Adverse construction-related transportation impacts would primarily relate to temporary delays (up to 30 minutes, Monday through Friday) on Warner Valley Road.

During intense construction periods, there would be local, short-term, moderate, adverse impacts to transportation conditions. Construction activities would generate varying numbers of vehicle trips (depending on the type of work) to accommodate construction workers, trucks, and equipment. Vehicle trips generated by the construction activities would have readily apparent, but localized and short-term, adverse impacts on traffic flow and traffic safety in the project area. Less intensive construction efforts at the project site (e.g., revegetation and restoration efforts) would require fewer workers and few truck trips, and would have local, short-term, minor, adverse impacts to traffic flow and traffic safety conditions.

Mitigation measures (e.g., implementation of a traffic control plan, with advance warning signs, and flaggers to direct traffic) would be employed to reduce transportation effects (though the measures would not change the magnitude of the adverse effects). Therefore, the effect of increased traffic volumes associated with construction activities in the Warner Valley area would be minor to moderate, depending on the intensity of the construction activity and the traffic volumes on area roads used by construction-related vehicles.

Operation-related Effects on Traffic Flow Conditions

Under Alternative 2, the number of overnight accommodation facilities for visitors in the Warner Valley area (lodging and campsites) would not change from that under Alternative 1. With the number of park overnighers unchanged, there would be no change to the level of traffic entering and leaving the Warner Valley.

Relocation of the fee station (with provision for three parking spaces) would have a local, long-term, moderate, beneficial impact on traffic flow because it would eliminate a potential

conflict point that occurs whenever different drivers choose to take different (potentially conflicting) actions (i.e., stop their vehicles in the road, or park at the ranger station and walk back to access the fee station), and traffic flow in the entry area would be noticeably smoother than under Alternative 1.

Proposed actions to improve the delineation of parking spaces in the Warner Valley area would have a local, long-term, moderate, beneficial impact on traffic flow because drivers would be able to maneuver more predictably than under Alternative 1.

Construction of a new access road to the water tank at the ranger station would have a local, long-term, minor, beneficial impact on traffic flow because vehicle access to and from the tank would be seen as such (i.e., not as a road to a visitor destination, as it would under Alternative 1).

Operation-related Effects on Traffic Safety/Conflicts

As they would for traffic flow conditions, relocation of the fee station (with parking spaces), and improved delineation of parking spaces, would have a local, long-term, moderate, beneficial impact on traffic safety because it would eliminate the potential conflict points. Similarly, construction of a new access road to the water tank at the ranger station would have a local, long-term, minor, beneficial impact on traffic safety.

Leaving the alignment of Warner Valley Road unchanged would have a local, long-term, moderate, adverse impact because the current blind curve would continue to be a potential traffic hazard conflict point.

Cumulative Impacts

The basis of cumulative effects to transportation discussed herein is the same as for Alternative 1. Forest thinning for fire breaks will increase the line of sight and lessen both the hazard of deer crossing and oncoming vehicles.

Conclusion

The Preferred Alternative 2 would have a short-term, minor to moderate, adverse effect, and a long-term, minor to moderate, beneficial effect. Alternative 2 would cause short-term, minor to moderate, adverse impacts (after mitigation) during site redevelopment; long-term, moderate, beneficial impacts to traffic flow conditions; and long-term, minor, beneficial effects on traffic safety/conflicts.

Analysis of Environmental Consequences – Alternative 3

Transportation

Analysis

Construction-related Transportation Effects

Under Alternative 3, the adverse construction-related impacts on transportation conditions would be largely the same as described under Alternative 2. As described under Alternative 2, there would be local, short- and long-term, moderate, adverse impacts to transportation conditions during intense construction periods under Alternative 3. Adverse construction-related transportation impacts would primarily relate to temporary delays on Warner Valley Road. As with Alternative 2, vehicle trips generated by the construction activities would have readily apparent, but localized and short-term, adverse impacts on traffic flow and traffic safety in the project area. The adverse transportation impacts associated with the less intensive construction efforts also would be similar to those described under Alternative 2.

Although there would be minor differences in the construction phasing, the overall magnitude and nature of adverse impacts associated with construction activities would be similar to those described for Alternative 2. Alternative 3 would implement similar mitigation measures as those discussed under Alternative 2; these measures would somewhat lessen the adverse construction-related impacts to traffic flow and traffic safety, but would not change the magnitude of the adverse effects.

Operation-related Effects on Traffic Flow Conditions

The number of lodging and camping units will be slightly less, but parking spaces would be the same as under Alternative 2. It is not expected that there would be any change to the level of traffic entering and leaving the Warner Valley.

Like Alternative 2, Alternative 3 would have a local, long-term, moderate, beneficial impact on traffic flow because of the relocation of the fee station (with provision for three parking spaces), which would eliminate a potential conflict point that occurs whenever different drivers choose to take different (potentially conflicting) actions (i.e., stop their vehicles in the road, or park at the ranger station and walk back to access the fee station), and traffic flow in the entry area would be noticeably smoother than under Alternative 1.

Also like Alternative 2, Alternative 3 would have a local, long-term, moderate, beneficial impact on traffic flow because of the proposal to improve the delineation of parking spaces in the Warner Valley area, which would enable drivers to maneuver more predictably than under Alternative 1.

The proposed chain to control access to the water tank at the ranger station would have a local, long-term, minor, beneficial impact on traffic flow because it would provide a clearer message to visitors as to the road's purpose (i.e., not as a road to a visitor destination, as it would under Alternative 1).

Operation-related Effects on Traffic Safety/Conflicts

Like Alternative 2, relocation of the fee station (with parking spaces) and improved delineation of parking spaces under Alternative 3 would have a local, long-term, moderate, beneficial impact on traffic safety because it would eliminate the potential conflict points. Similarly, the proposed chain to control access to the water tank at the ranger station would have a local, long-term, minor, beneficial impact on traffic safety.

As opposed to Alternative 2 (which would leave the entry road as is), Alternative 3 would have a local, long-term, moderate, beneficial impact on traffic safety because widening the current blind curve would improve the line of sight for drivers, reducing the potential traffic hazard conflict point.

Cumulative Impacts

The basis of cumulative effects to transportation discussed herein is the same as for Alternative 1. Forest thinning for fire breaks will increase the line of sight and lessen both the hazard of deer crossing and oncoming vehicles.

Conclusion

Alternative 3 would have a short-term, minor to moderate, adverse effect, and long-term, moderate, beneficial effect. Alternative 3 would cause short-term, minor to moderate, adverse impacts (after mitigation) during site redevelopment; and long-term, moderate, beneficial impacts to both traffic flow and traffic safety/conflicts.

4.9 Scenic Resources

Methodology

Context, duration, and intensity together determine the level of impact for an activity. It may be necessary to evaluate all three factors together to determine the level of impact of scenic resources. In the case of scenic resources, it is difficult to determine whether a particular action would be considered adverse or beneficial, given the subjective nature of evaluating visual stimuli. For the purpose of this analysis, an action shall be considered beneficial if it reduces the visual presences of man-made structures or influences. An action shall be considered adverse if it alters existing natural resources or increases the visual presence of man-made structures.

The methodology used to assess impacts on scenic resources in this document is consistent with National Park Service *Management Policies 2006* and the *Cultural Landscape Report for Drakesbad Guest Ranch (CLR)*. The Viewshed Management Recommendations from the CLR include:

- Preserve and maintain historic views through the meadow by selective thinning and/or removal of vegetation in consultation with natural resources staff.
- Prepare a Vegetation Management Plan for the meadow to address treatment strategies that balance natural resource objectives and cultural resource values for long-term preservation of the historic scene.

The Cultural Landscape Report identified three critical viewsheds for Drakesbad Guest Ranch: (1) the view from the trail looking across the upper meadow to the west end of the meadow; (2) the view from the east side of the Lodge to Mount Harkness; and (3) the view from the pool to the lodge. In order to frame the impacts on scenic resources, this section will evaluate impacts to these three viewsheds as well as the view of the night sky. This will allow an approximation of how Warner Valley's scenic resources would change should any of the proposed alternatives be carried out.

Scenic Resources

National Park Service *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

The potential for change in scenic resources proposed by the alternatives was evaluated by identifying projected changes in natural and built features, and determining whether or how these projected changes would affect the area's scenic resources, to what degree, and for what duration.

Impact intensity	Impact Description
Negligible	Effects to the visual quality of the landscape would be at or below the level of detection; changes would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience.
Minor	Effects to the visual quality of the landscape would be detectable, localized, and would be small and of little consequence to the visitor experience. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate	Effects to the visual quality of the landscape would be readily detectable, with consequences at the regional level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	Effects to the visual quality of the landscape would be obvious, with substantial consequences to the visitor experience in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Duration:
Short-term – Occurs only during the construction period.
Long-term – Effects continue after the construction period.

Type:
Beneficial – Effects that would improve views or would reduce the appearance of built features of the project area.
Adverse – Effects that would degrade views or would increase the appearance of built features in the project area.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Scenic Resources

Analysis

Under Alternative 1, none of the facilities of the proposed project would be implemented. Existing visual impacts to the historic viewshed would not be removed. However, the continued effort to dry out the Drakesbad Meadow could lead to minor tree encroachment and decreased views. With no action, noncontributing resources that are within the historic viewshed will continue to impact the scenic resources.

Cumulative Impacts

Cumulative effects to scenic resources discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. In the past, views were maintained through vegetation management and land use practices (grazing) by the Siffords throughout the period of significance. In the present changes in management strategies of the meadow have resulted in vegetation growth that is impacting the historic views. In the future, there are no plans that are likely to significantly alter the viewshed. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 1 would result in long-term, minor, adverse to existing conditions.

Impairment: Under Alternative 1 no scenic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 1 would not impair the park's scenic resources.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Scenic Resources

Analysis

Under Alternative 2, there would be a significant difference between operational impacts on the scenic viewsheds and construction related impacts on the scenic viewsheds. Operational impacts on scenic resources would be minor, long-term and beneficial while construction impacts would be moderate, short-term and adverse.

Construction Impacts

Alternative 2 would require extensive construction throughout the project site. Construction occurring at the campgrounds, concessioners housing and bathhouse would cause visual disruptions in those areas but would not have visual impacts for the critical viewsheds. The view to Drakesbad Guest Ranch and the view of Drakesbad Meadow will experience construction related impacts.

The view to Drakesbad Guest Ranch across the meadow will experience a moderate, short-term and adverse impact. Equipment required to improve that pathway will be highly visible. Similarly, trail improvements across the fen will be highly visible. As such, the view of Drakesbad Meadow will experience a moderate, short-term and adverse impact.

Operational Impacts

There are proposed changes in Warner Valley that will affect viewsheds at the project site. These impacts are discussed below according to which of the viewsheds they will impact.

View to Mount Harkness. The view to the east of the lodge up to Mount Harkness will be improved by the removal of the volleyball court and the improvement of the road to the bathhouse.

View to Drakesbad Guest Ranch. The view of Drakesbad Guest Ranch from the pool would be improved with the removal of noncontributing features such as the volleyball court and the reduction of the pool access road width.

View of Drakesbad Meadow. This alternative would restore fen ecology to the meadow through filling man-made features with fill materials. As a result some additional

boardwalk trails similar to the trail from the corral to the fen may need to be installed. The restoration would result in a negligible impact to the historic viewshed.

View of Night Sky. Alternative 2 would potentially add external lighting to the existing lighting at the Drakesbad Guest Ranch and campground. However NPS policies for maintaining dark night skies will be adhered to with any new proposed lighting.

Cumulative Impacts

Cumulative effects to scenic resources discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. In the past, views were maintained through vegetation management and land use practices (grazing) by the Siffords throughout the period of significance. In the present changes in management strategies of the meadow have resulted in vegetation growth that is impacting the historic views. In the future, there are no plans that are likely to significantly alter the viewshed. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

The proposed project will have a beneficial impact on Warner Valley's scenic resources. The removal of noncontributing features will preserve the historic viewshed of Drakesbad Guest Ranch and the view to Mount Harkness. The view of the night sky will continue to be relatively unobscured by external lighting. Consequently, the overall impact on scenic resource in Warner Valley is long-term, moderate, beneficial under Alternative 2.

Impairment: Under Alternative 2 no scenic resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource values highlighted in the 2002 General Management Plan, therefore Alternative 2 would not impair the park's scenic resources.

Analysis of Environmental Consequences – Alternative 3

Scenic Resources

Analysis

Construction Impacts

Alternative 3 would require extensive construction in the Drakesbad Guest Ranch area and the Dream Lake Dam area of the project site. Construction occurring at the campgrounds, concessioners housing and bathhouse would cause visual disruptions in those areas but would not have visual impacts for the critical viewsheds. The view to Drakesbad Guest Ranch will experience construction related impacts.

The view to Drakesbad Guest Ranch across the meadow will experience a moderate, short-term and adverse impact. Equipment required to install culverts and check dams will be visible. This

alternative also proposes to reconstruct the dam at Dream Lake. Dam reconstruction will require that 32 trees be removed prior to construction. Additionally, heavy equipment will be needed to complete the construction.

Operational Impacts

There are proposed changes in Warner Valley that will alter the historic viewsheds at the project site. These impacts are discussed below according to which of the viewsheds they will impact.

View to Mount Harkness. The view to the east of the lodge up to Mount Harkness will be improved by the removal of the volleyball court and the improvement of the road to the bathhouse.

View to Drakesbad Guest Ranch. The view of Drakesbad Guest Ranch from the pool would be improved with the removal of noncontributing features such as the volleyball court and the reduction of the pool access road width.

View to Drakesbad Meadow. In this alternative, measures to be implemented include the installation of metal check dams at key points in drainage ditches as well as the installation of culverts. The restoration would result in a negligible impact to the historic viewshed.

View of Night Sky. Alternative 3 would potentially add external lighting to the existing lighting at the Drakesbad Guest Ranch and campground. NPS policies for maintaining dark night skies will be adhered to with any new proposed lighting.

Cumulative Impacts

Cumulative effects to scenic resources discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. In the past, views were maintained through vegetation management and land use practices (grazing) by the Siffords throughout the period of significance. In the present changes in management strategies of the meadow have resulted in vegetation growth that is impacting the historic views. In the future, there are no plans that are likely to significantly alter the viewshed. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

The proposed project will have a beneficial impact on Warner Valley's scenic resources. The removal of noncontributing features will preserve the historic viewshed of Drakesbad Guest Ranch and the view to Mount Harkness. The view of the night sky will continue to be relatively unobscured by external lighting. Consequently, the overall impact on scenic resource in Warner Valley is long-term, moderate, beneficial under Alternative 3.

Impairment: Under Alternative 3 no resources specific to the park's purpose would be discernibly affected, and there would be no change to the natural and cultural integrity of the park, nor effects to the resource value highlighted in the 2002 General Management Plan, therefore Alternative 3 would not impair the park's scenic resources.

4.10 Park Operations and Facilities

Methodology

The impact analysis is based on the current description of park operations presented in Chapter 3, Affected Environment. Park operations, for the purpose of this analysis, refers to the quality and effectiveness (including the frequency or complexity of maintenance requirements) of the infrastructure used in the operation of the park to adequately protect and preserve vital resources and provide for an effective visitor experience. This includes consideration of the condition and usefulness of the facilities used to support the operations of the park. Facilities included in this project encompass the park facilities in the Warner Valley area.

The potential for change in park operations and facilities proposed by the alternatives was evaluated by identifying projected changes in park operations and facilities, and determining whether or how these projected changes would affect the desired park operations and facilities, to what degree, and for what duration.

Impact intensity	Impact Description
Negligible	Park operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on park operations.
Minor	Changes in park operations and facilities would be detectable and would be of a magnitude that would not have an appreciable effect on park operations.
Moderate	Changes in operations and facilities would be readily apparent and result in a substantial change that would be noticeable to staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major	Changes in park operations and facilities would be readily apparent, result in a substantial change in park operation in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, extensive, and success could not be guaranteed.

Duration:
 Short-term – Effects lasting for the duration of the treatment action.
 Long-term – Effects lasting longer than the duration of the treatment action.

Type:
Beneficial – Effects that would increase the quality and/or effectiveness, or reduce maintenance requirements, of park infrastructure and facilities, or that enhance the effectiveness of park staff in fulfilling their responsibilities.
Adverse – Effects that would decrease or limit the quality and effectiveness of park infrastructure; would increase the frequency or difficulty of infrastructure maintenance requirements; or would not change existing safety concerns with respect to Warner Valley-area utility and facility infrastructure.

Analysis of Environmental Consequences – Alternative 1 (No Action)

Park Operations and Facilities

Analysis

The no action alternative, or no change in the existing conditions of the park operations and facilities at Warner Valley, would result in a continuation of existing impact and use by staff and visitors of the infrastructure and facilities of the park. Without changes to the existing conditions, safety for the guests and park staff will continue to have an adverse effect. The existing design and layout of the entry way, and deteriorating conditions of the park's facilities has lead to moderate safety hazards if no changes are made. The dining hall outdoor area does not have a firm surface and is not ADA accessible. Impacts from the horse corral include effluent flows into the meadow, seed from non-native grasses from the hay, wildlife attractants, and foul smells will continue to plague this area. The employee housing will continue to have a lack of privacy and social space. Walkways and trails throughout Warner Valley may continue to multiply creating more negative impact on the natural resources and do not follow the historic path alignments. The access trail/road to the pool and bathhouse and the trail from Drakesbad Guest Ranch leading from the corral to the trail network both create an obstruction to water flow in the meadow/fen complex. The volleyball court detracts from the experience of the cultural landscape and is currently located in the sensitive meadow landscape.

Energy and Conservation Potential

The existing conditions under the no action alternative do not incorporate energy efficient conservation measures.

Cumulative Impacts

A major source of impacts to the operations and facilities is the continued use of this site in its existing condition by visitors and staff. Cumulative effects to park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Warner Valley area of Lassen Volcanic National Park, in combination with potential effects of this alternative. The water and sewer systems were rebuilt by NPS in the 1990s, therefore, the Park anticipates several decades of low maintenance of these systems. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

If no change occurs in the existing conditions of the park operations and facilities, adverse impact of both natural and cultural resources is likely to occur. The impact of this alternative on park operations and facilities would be primarily localized and the effect would not be considered severe. Over time, conditions would continue to be degraded. The no-action alternative would have a long-term, moderate, adverse effect.

Analysis of Environmental Consequences – Alternative 2 (Preferred Alternative)

Park Operations and Facilities

Analysis

Alternative Two (the preferred alternative) would result in changes in existing conditions of the park operations and facilities that would protect and repair the natural and cultural resources and promote public safety through design. It may also result in a minor short-term, adverse effect due to the construction activity associated with the re-design. The re-design will also result in the removal of five trees in the entry area. This alternative will improve the park operations and facilities that will preserve the historic character of the park, protect and restore the natural resources, and provide a more accessible facility. Relocating the Warner Valley entrance and constructing a new service road to the water tank at the ranger station will improve the operation of the fee collection and safety at the entrance. Renovations to the campgrounds will improve ADA compliance and accessibility, as well as provide for restoration opportunities in the lower campground. Parking capacity will be increased and the concessioner housing and service center will be improved. The new center will be outside of the historic district and redesigned with more space for employees and a more organized arrangement of facilities. The new service center buildings and utility extensions will require an increase in operations and maintenance costs and therefore a minor adverse impact. Other benefits to the park operations and facilities include the existing problems with the corral with effluent mitigation through a bio-filtration system and enclosing the feed shed. The volleyball court will be removed and the area restored with native vegetation. Several features will be redesigned for accessibility including the pool shower area, the outdoor dining area, and the upper campground. Removal of Dream Lake Dam will eliminate the operations and maintenance costs associated with the upkeep of the dam.

Energy and Conservation Potential

Under this alternative energy and conservation potential would be incorporated into the bathhouse reconstruction. A new rooftop photovoltaic array would provide electricity for running pumps and a new solar/geothermal water heating system would supplement or replace propane-fired water heaters. The hybrid power systems will require an increase in operations and maintenance. Both systems would be located on the south side of the bathhouse roof, facing away from Drakesbad Guest Ranch, and would maintain current roof color and design. It may be possible to use water from the hot springs in a heat exchanging system to heat the water for restrooms and showers. At Drakesbad Guest Ranch, a hybrid power system including photovoltaic panels and a propane generator would be incorporated into the reconstruction.

Cumulative Impacts

The basis of cumulative effects to park operations and facilities discussed herein is the same as for Alternative 1. The water and sewer systems were rebuilt by NPS in the 1990s, therefore, the Park anticipates several decades of low maintenance of these systems. Given the isolated nature

of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 2 would have a long-term, moderate, beneficial effect. The impact of this alternative on park operations and facilities would be primarily localized and the effect would not be considered severe. Removal of trees and other construction-related impacts would result in short-term, moderate, adverse effects.

Analysis of Environmental Consequences – Alternative 3

Park Operations and Facilities

Analysis

In Alternative 3, the entrance fee area would be reconfigured with the iron ranger moved adjacent to the ranger station. This design would not remove any trees for its construction. The service road to the water tank would remain, but a chain gate across the entry would divert cars from using it mistakenly. This design would also install a culvert to decrease erosion. The following changes will occur to the park operations and facilities: construction of a two-story building for the employee housing; moving the corral structure and feeding area to north of Warner Valley Road; removing the outdoor dining area entirely, closing of lower campground facilities, and replacing the existing Dream Lake Dam with a new dam structure. There will be a reduction of the number of campsites in Alternative 3, but other modifications to the trail and day use parking and concessioner area and service center will be identical to Alternative 2. The new service center buildings and utility extensions will require an increase in operations and maintenance costs and therefore a minor adverse impact.

Energy and Conservation Potential

Under this alternative, the bathhouse reconstruction will incorporate a new rooftop photovoltaic array to provide electricity for running pumps and a new solar water heating system would supplement or replace propane-fired water heaters. The hybrid power systems will require an increase in operations and maintenance. Both systems would be located on south side of the bathhouse roof, facing away from Drakesbad Guest Ranch, and would maintain current roof color and design.

Cumulative Impacts

The basis of cumulative effects to park operations and facilities discussed herein is the same as for Alternative 1. The water and sewer systems were rebuilt by NPS in the 1990s, therefore, the Park anticipates several decades of low maintenance of these systems. Given the isolated nature of the Warner Valley area, there are no other past, present, and reasonably foreseeable future actions to analyze.

Conclusion

Alternative 3 would have an overall long-term, moderate, beneficial effect.

4.11 Mitigation Measures for all Action Alternatives

Impact Resource Area	Mitigation Measures
Construction Measures	Prior to entry into the park, steam-clean heavy equipment to prevent importation of non-native plant species, tighten hydraulic fittings, ensure hydraulic hoses are in good condition and replace if damaged, and repair all petroleum leaks.
	Inspect the project to ensure that impacts stay within the parameters of the project area and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with all applicable permits or project conditions. Store all construction equipment within the delineated work limits. Confine work areas within creek channels to the smallest area necessary.
	Implement compliance monitoring to ensure that the project remains within the parameters of National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance documents.
	Provide a project orientation for all construction workers to increase their understanding and sensitivity to the challenges of the special environment in which they will be working.
	If deemed necessary, demolition/construction work on weekends or federal government holidays may be authorized, with prior written approval of the Superintendent.
	Remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Remove all debris from the project site, including all visible concrete, timber, and metal pieces.
	Cover and/or seal truck beds and stockpiles to minimize blowing dust or loss of debris.
	Maintain adequate dust suppression equipment and using clean water to control excess airborne particulates at staging areas, active construction zones, and unpaved roads leading to/from active construction areas.
	Develop an emergency notification plan that complies with park, federal, and state requirements and allows contractors to properly notify park, federal, and/or state personnel in the event of an emergency during construction activities. This plan will address notification requirements related to fire, personnel, and/or visitor injury, releases of spilled material, evacuation processes, etc. The emergency notification plan will be submitted to the park for review/approval prior to commencement of construction activities
	Limit truck and related construction equipment speeds in active construction areas to a maximum of 15 miles per hour and strictly adhering to park regulations and posted speed limits in other areas while inside park boundaries.
Geologic Resources and Hazards	An Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan shall be prepared by the Construction Contractor for the project to address hazardous materials storage, spill prevention and response. The Plan shall be submitted for park review and approval prior to construction.
	Store and use all hazardous materials in compliance with federal regulations. All applicable Materials Safety Data Sheets will be kept on site for inspection.
	Hazardous or flammable chemicals shall be prohibited from storage in the staging area, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers.
	Comply with all applicable regulations and policies during the removal and remediation of asbestos, lead paint, and polychlorinated biphenyls.
	Develop and implement a comprehensive spill prevention/response plan that complies with federal and state regulations and addresses all aspects of spill prevention, notification, emergency spill response strategies for spills occurring on

Impact Resource Area	Mitigation Measures
Geologic Resources and Hazards (cont.)	land and water, reporting requirements, monitoring requirements, personnel responsibilities, response equipment type and location, and drills and training requirements. The spill prevention/response plan will be submitted to the park for review/approval prior to commencement of construction activities.
	To minimize the possibility of hazardous materials seeping into soil or water, check equipment frequently to identify and repair any leaks. Standard measures include hazardous materials storage and handling procedures; spill containment, cleanup, and reporting procedures; and limitation of refueling and other hazardous activities to upland/nonsensitive sites. Provide an adequate hydrocarbon spill containment system (e.g., absorption materials, etc.) on site, in case of unexpected spills in the project area. Ensure equipment is equipped with a hazardous spill containment kit. Ensure that personnel trained in the use of hazardous spill containment kits are on site at all times during construction activities.
Hydrology and Water Quality	Use approved siltation and sediment control devices in construction areas to reduce erosion and surface scouring.
	Use approved siltation and sediment control devices appropriate to the situation in grading areas to capture eroding soil before discharge to riparian channels.
	Conserve and salvage topsoil for reuse. Materials will be reused to the maximum extent possible.
	Develop and implement a comprehensive stormwater pollution prevention plan for construction activities that complies with federal and state regulations and addresses all aspects of stormwater pollution prevention. The plan will be submitted to the park for approval prior to construction activities. The plan will include measures such as: controlling erosion, sedimentation, and compaction, and thereby reducing water pollution and adverse water quality effects; and using silt fences, sedimentation basins, etc. in construction areas to reduce erosion, surface scouring, and discharge to water bodies.
	To the extent possible, schedule the use of mechanical equipment during periods of low precipitation to reduce risk of accidental hydrocarbon leaks or spills. When mechanical equipment is necessary outside of low precipitation periods, use NPS-approved methods to protect soil and water from contaminants.
	Dispose of volatile wastes and oils in approved containers for removal from construction sites to avoid contamination of soils, and drainages. Inspect equipment for hydraulic and oil leaks prior to use on construction sites, and implement inspection schedules to prevent contamination of soil and water. Keep absorbent pads, booms, and other materials on site during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous material spills
Vegetation	Replace vegetation removed with appropriate species grown from seeds or cuttings collected in Warner Valley.
Wetlands	Avoid all existing wetland areas to the extent feasible; clearly demarcate wetlands prior to construction in their vicinity.
	Protect wetland areas during construction through the use of best management practices (BMPs) such as erosion control fencing or wattles.
	Restore all wetland areas impacted during construction to natural conditions using native stock.
	Heavy equipment required for Dream Lake dam removal and replacement should be airlifted into the project site; brought in over a temporary platform road through Drakesbad Meadow; or brought in over the snow, prior to complete snowmelt and ground thaw to minimize impacts to wetlands and vegetation.
Wildlife	Survey for nesting raptors and passerine birds prior to construction.
	Use standard BMPs to protect wildlife during construction, i.e., place ramps in trenches to allow egress, establish no disturbance buffers if active bird nests are found.
Special-status Species	Survey for nesting special-status birds prior to construction.
	Survey for special-status bat maternity colonies prior to construction.

Impact Resource Area	Mitigation Measures
Special-status Species (cont.)	Survey for special-status plants prior to work in Drakesbad Meadow, other wetlands, and in riparian areas.
	Inform Park Biologist immediately of any special-status species sightings. Stop work if there is potential threat to species.
Soundscapes	Ensure that all construction equipment has functional exhaust/muffler systems.
	Submit a construction work plan/schedule that minimizes construction-related noise in noise-sensitive areas to the park for review/approval prior to commencement of construction activities.
	Use hydraulically or electrically powered construction equipment, when feasible.
	Locate stationary noise sources as far from sensitive receptors as possible.
	Limit the idling of motors except as necessary (e.g., concrete mixing trucks).
	To the extent possible, perform all on-site noisy work above 76 A-weighted decibels (dBA) (such as the operation of heavy equipment) during normal construction hours to minimize disruption to nearby park users. Normal construction work hours on contracts and day labor projects in the park are between 7:00 am and 5:30 pm, Monday through Friday, and requests for extended hours or weekends must be approved by the superintendent.
Cultural Resources	A qualified archeologist, as directed by the Secretary of the Interior and National Park Service standards, will monitor construction activities, especially those that have a potential to affect cultural features.
	If additional, previously unknown cultural resources are encountered during construction, temporarily suspend work in the immediate area to document discovered resources according to National Park Service standards.
	Conduct site-specific reconnaissance for cultural resources to avoid potential impacts to resources that may occur as a result of the removal of trees and vegetation conducted for the maintenance of the view corridors.
	Design all new construction within historic districts or adjacent to historic sites to be compatible in terms of architectural elements, scale, massing, materials, and orientation.
	Install interpretive signs about Native American use of Warner Valley
	Undertake all treatments within cultural landscapes in keeping with the <i>Secretary of The Interior's Standards for the Treatment of Historic Properties</i> .
	Install interpretive signs highlighting the significance of the Drakesbad Guest Ranch Historic District and Dream Lake Dam.
Visitor Experience	Develop and implement a visitor outreach and communication plan that addresses means for effectively communicating construction and other visitor facility closure, relocation, and detour schedules to the public.
	To the extent possible, schedule/phase construction activities to allow for continued visitor access to the Drakesbad Guest Ranch and its associated facilities.
	Schedule construction activities that would interrupt operations at visitor serving, orientation, and interpretation facilities (food service, retail, tour, activity desk, information kiosk, and interpretive programming) during lower visitor-use periods (late fall and winter), to the extent possible.
Public Health and Safety	Outline measures to largely offset the potential for public exposure to noxious materials or contaminants that may be present during construction in the project area (i.e., by providing established and maintained walkways and bridges across the site, covering walking paths with clean soil and asphalt, and providing barrier fencing along trails)
	Provide protective fencing enclosures around construction areas, including utility trenches, to protect public health and safety.

Impact Resource Area	Mitigation Measures
Transportation	<p>Develop and implement a comprehensive traffic control and visitor protection plan for park review/approval that:</p> <ul style="list-style-type: none"> • Complies with necessary U.S. Department of Transportation, Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI-Traffic Control for Construction and Maintenance Operations, and California Department of Transportation Standard Specifications, Section 12; • Provides procedures for preparing and submitting specific road closure, traffic control, and detour plans for each specific area of project construction not less than three weeks before commencement of construction activities in each area; • Provides procedures for managing staging areas to restrict public access and maintain site safety; and • Ensures that visitors are safely and efficiently routed around construction areas in Warner Valley. <p>Install appropriate traffic signs.</p> <p>Locate construction worker parking outside of Warner Valley, with the exception of key supervisory personnel.</p>
Scenic Resources	<p>To the extent possible, schedule necessary 24-hour construction activities in the immediate vicinity of campgrounds and lodging units such that they occur during periods when those areas are closed or not in use.</p> <p>Direct and shield night lighting associated with construction equipment to minimize light scatter effects.</p> <p>Design interior and exterior lighting in new or renovated facilities to prevent escaped light</p> <p>Use low-height, lighted bollards in parking areas in lieu of overhead pole lighting</p> <p>Use downward-facing and unobtrusive luminaries at facilities and building entrances and exits.</p> <p>If necessary NPS will conduct a view management assessment to ensure minimal impacts to viewsheds in Warner Valley.</p>
Park Operations and Facilities	<p>Develop and implement a comprehensive waste management plan that complies with federal and state regulations and addresses all aspects related to the transportation, storage, and handling of construction-related hazardous and nonhazardous liquid and solid wastes and submit the plan to the park for review/approval prior to the commencement of construction activities.</p> <p>Require construction personnel to adhere to park regulations concerning food storage and refuse management.</p> <p>Properly secure food waste during the workday and remove all food waste from site at the end of each workday.</p>

CHAPTER 5

Consultation and Coordination

5.1 Public Scoping and Workshops

An informal scoping process for this Environmental Impact Statement (EIS) was initiated on June 1, 2004 with the posting of an information sign at the Drakesbad Guest Ranch Lodge and a request for scoping comments. The formal scoping process was initiated on June 24, 2005 with the publication of the Notice of Intent to prepare an EIS in the Federal Register. Scoping flyers were mailed to 1,131 individuals and organizations announcing the EIS Notice of Intent; 15 written comments were received as a result of this mailing. Public scoping for the original Dream Lake Dam Management Plan was initiated on April 4, 2003 with the publication of the Notice of Intent to prepare an EIS in the Federal Register. Nine-hundred letters announcing the EIS Notice of Intent were sent and 100 scoping comments were received. All comments received from that scoping process have been considered in this current EIS process. Public scoping meetings were held for the Dream Lake Management Plan November 4-7, 2002 in the towns of Chico, Red Bluff, Redding, and Chester. Public scoping meetings for the Warner Valley Comprehensive Site Plan were held on June 13-15, 2005 in the towns of Red Bluff, Chester, and Vacaville. All issues that were identified during the scoping process and that were received by October 14, 2005 have been included in this document.

5.2 Compliance with Federal or State Regulations

National Environmental Policy Act (NEPA). The National Environmental Policy Act process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. Regulations implementing the National environmental Policy Act are set forth by the Council on Environmental Quality.

National Park Service Management Policies. Management Policies is the basic policy document of the National Park Service, superseding the 1988 edition. This document is the highest of the three levels of guidance documents in the National Park Service Directives System provides policies applicable to management of the Nation Park System.

Endangered Species Act. The Endangered Species Act protects threatened and endangered species, as listed by the U.S. Fish and Wildlife Service, from unauthorized take and directs federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 of the act defines federal agency responsibilities for consultation with the

U.S. Fish and Wildlife Service and requires a preparation of a biological assessment to identify any threatened or endangered species that is likely to be affected by the proposed action.

National Historic Preservation Act. The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places. The State Historic Preservation Officer (SHPO) advises and assists in carrying out Section 106 responsibilities by reviewing project plans and helping determine whether any historic properties or resources will be affected by the proposed project.

Executive Order 11990: Protection of Wetlands. This executive order established the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

Federal Clean Air Act. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulation.

Final project approval may require permits or require approval and/or consultation from the following agencies:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service – Section 7 consultation
- California Department of Fish and Game
- California State Historic Preservation Officer – Section 106
- Regional Water Quality Control Board
- Division of Safety of Dams

Annual consultation with tribes occurred in 2003 and 2004 with the Dream Lake EIS. Annual consultation letters were sent in 2005 and 2006 describing the Warner Valley Comprehensive Site Plan as one of the ongoing park projects. Notices for public meetings were sent to park-associated tribes. The Park is in the process of consulting with four major tribes associated with Lassen Volcanic National Park: Pit River Tribe, Susanville Indian Rancheria, Greenville Rancheria of Maidu Indians, and Redding Rancheria.

5.3 List of Preparers

Louise Johnson, Lassen Volcanic National Park
Sean Eagan, Lassen Volcanic National Park
Nancy Malone, Siegel and Strain
Darcey Rosenblatt, ESA
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Peter Hudson, ESA
Jack Hutchinson, ESA
Martha Lowe, ESA
Kim Maeyama, ESA

Acronym List

ADA:	Americans with Disabilities Act
BMPs:	best management practices
CBA:	choosing by advantages
CDFG:	California Department of Fish and Game
CEQ:	Council on Environmental Quality
CNDDDB:	California Natural Diversity Database
CNPS:	California Native Plant Society
dB:	decibel
dBA:	A-weighted frequency dependent scale
DO-12:	NPS Director's Order #12
EIS:	Environmental Impact Statement
FTA:	Federal Transit Administration
GMP:	General Management Plan
LAVO:	Lassen Volcanic National Park
NEPA:	National Environmental Policy Act
NPS:	National Park Service
NWI:	National Wetlands Inventory
PCT:	Pacific Crest Trail
PGA:	peak ground acceleration
PM10:	Particulate matter
SHPO:	State Historic Preservation Officer
USFWS:	United States Fish and Wildlife Service
USGS:	United States Geological Survey

Glossary

ADA-compliant: Facilities that are compliant with the Americans with Disabilities Act in ensuring equal opportunity for persons with disabilities in public accommodations.

Alternatives: Sets of management elements that represent a range of options for how, or whether to proceed with a proposed project. An environmental impact statement, such as the one in this Comprehensive Site Plan, analyzes the potential environmental and social impacts of the range of alternatives presented.

Beaver deceivers: Beaver deceiver devices are installed at culverts to prevent beavers from building dams but allow fish to pass through unimpeded. The beaver deceiver is essentially a wire mesh enclosure that is narrow at the culvert and widens upstream which prevents beavers from erecting a dam against culverts.

Bioengineering: A method of restoring and stabilizing sections of eroding stream bank with native riparian plant species in a layered method.

Biofiltration: A pollution control technique using living material to capture and biologically degrade process pollutants. The technology involves passing chemical-laden gases through a moist, porous medium containing active microorganisms.

Bone yard: Name of the location for storage of building materials and other supplies in Warner Valley.

Choosing by Advantages (CBA): A system of concepts and methods to structure decision-making. CBA quantifies the relative importance of non-monetary advantages or benefits for a set of alternatives and allows subsequent benefit and cost consideration during decision-making. CBA may be used as an evaluation method during the evaluation phase of the value analysis job plan, in lieu of the more traditional weighted-factor analysis. CBA is the preferred evaluation method where critical non-monetary benefits need to be evaluated.

Conifer: Any of a variety of mostly needle-leaved or scale-leaved, primarily evergreen, cone-bearing trees or shrubs such as pines, firs, and junipers.

Environmental Impact Statement (EIS): A public document required under the National Environmental Policy Act (NEPA) that identifies and analyzes activities that might affect the human and natural environment.

Fen: A type of wetland that is fed through surface water or groundwater with areas of peat soils and saturated conditions.

Hillslope: A hillside

Iron ranger: A fee collection box used at campgrounds, day-use facilities, etc. when those sites do not have full-time attendants.

National Environmental Policy Act (NEPA): The federal act that requires the development of an environmental assessment or environmental impact statement for federal actions that might have environmental, social, or other impacts.

National Historic Register: The National Park Service administers the National Register of Historic Places. The National Register is the official federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. National Register properties have significance to the history of their community state, or the nation.

No Action Alternative: The alternative in a plan that proposes to continue current management direction. "No action" means the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

Notice of Public Scoping: A notice to responsible agencies as well as the public and interested organizations requesting feedback and comments on an anticipated environmental project.

Photovoltaic: The process of converting sunlight into electricity through the use of solar cells.

Plumbing chase: A hollow wall area accommodating piping used for plumbing systems

Pole barn structure: A barn that consists of a roof extended over a series of poles. Pole barn structures are generally rectangular and lack exterior walls.

Record of Decision (ROD): The public document describing the decision made on selecting the “preferred alternative” in an environmental impact statement. See “environmental impact statement.”

Distribution List

In addition to this list of agencies, Tribes and public libraries, the Draft EIS will be provided to those organizations and individuals requesting a copy.

Government Agencies

Bureau of Indian Affairs
 Bureau of Land Management
 California Air Resources Board
 California Department of Fish and Game – Northern California North Coast Region
 California Department of Transportation
 California Highway Patrol
 California Regional Water Quality Control Board
 Feather River Recreation and Parks
 Federal Emergency Management Agency
 Lassen County Air Quality Management District
 Lassen County Planning Department
 Lassen County Sheriff
 Lassen Historical Society
 Lassen/Modoc California Department of Forestry and Fire Protection
 Lassen National Forest
 McArthur-Burney Falls Memorial State Park
 Mt. Lassen Trout Farm
 Northern Sierra Air Quality District
 Park Rangers Association of California
 Plumas County
 Plumas County National Forest
 Plumas County Sheriff
 Redding Chamber of Commerce
 Shasta County
 Shasta County Air Quality Management District
 Shasta County Sheriff
 Soil Conservation Service
 State Board of Forestry
 State of California
 Tehama County Air Quality Management District

Tehama County Sheriff
U.S. Army Corps of Engineers
U.S. Department of Interior – Bureau of Reclamation
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Geological Survey – Volcano Hazards Team

Tribes

Berry Creek Rancheria
Enterprise Rancheria
Greenville Rancheria
Mooretown Rancheria
Pit River Tribe
Redding Rancheria
Shingle Springs Rancheria
Susanville Rancheria

Libraries

Chester Library
Chico Public Library
Plumas County Library
Shasta County Library
Shingletown Library
Susanville District Library
Tehama County Library

APPENDIX A

Culvert Inventory

Appendix A Warner Valley Road Culvert Inventory

Warner Valley Road Culvert Inventory (survey begins at park boundary and heads west)

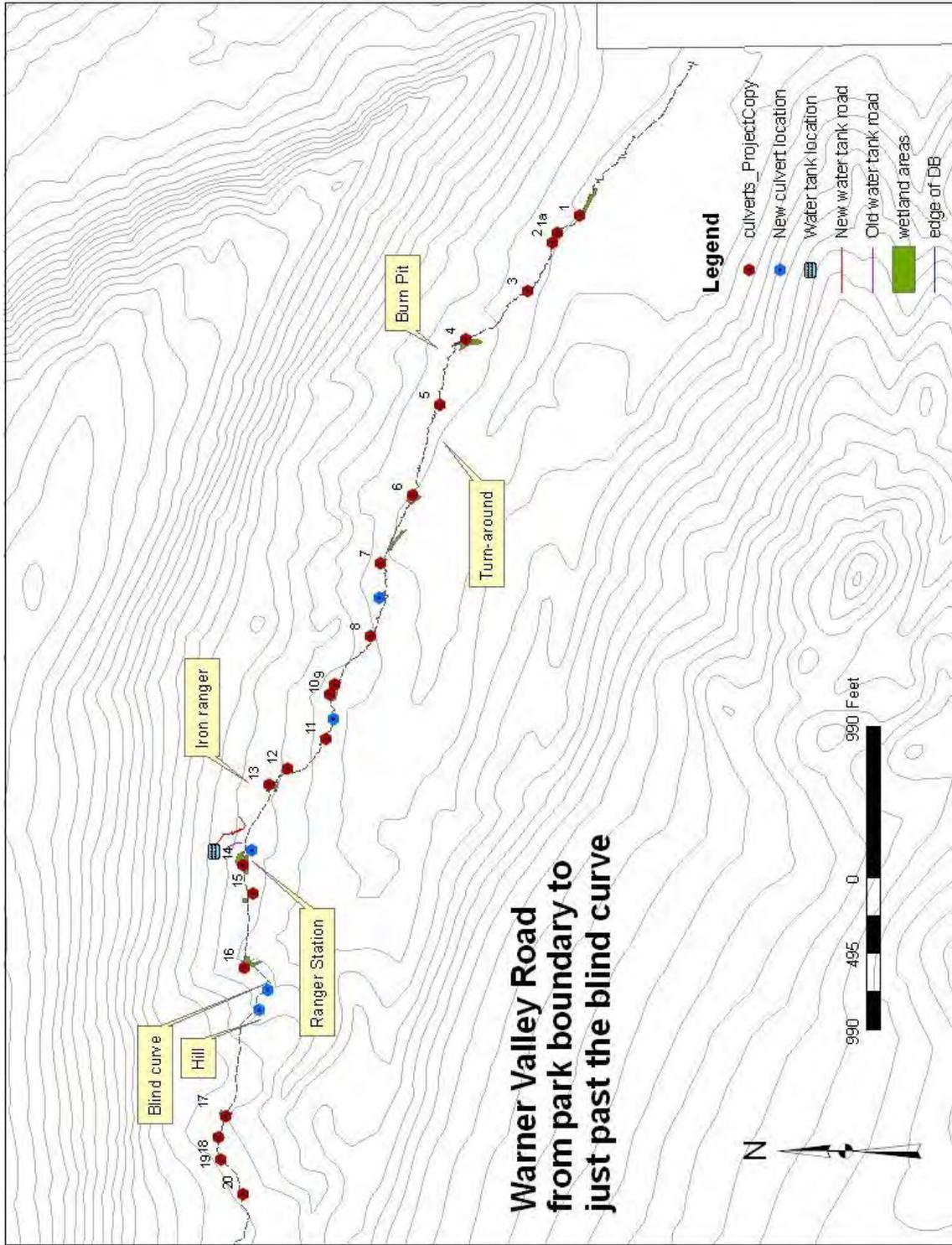
Survey Completed by L. Johnson and D. Frein, August 24, 2005

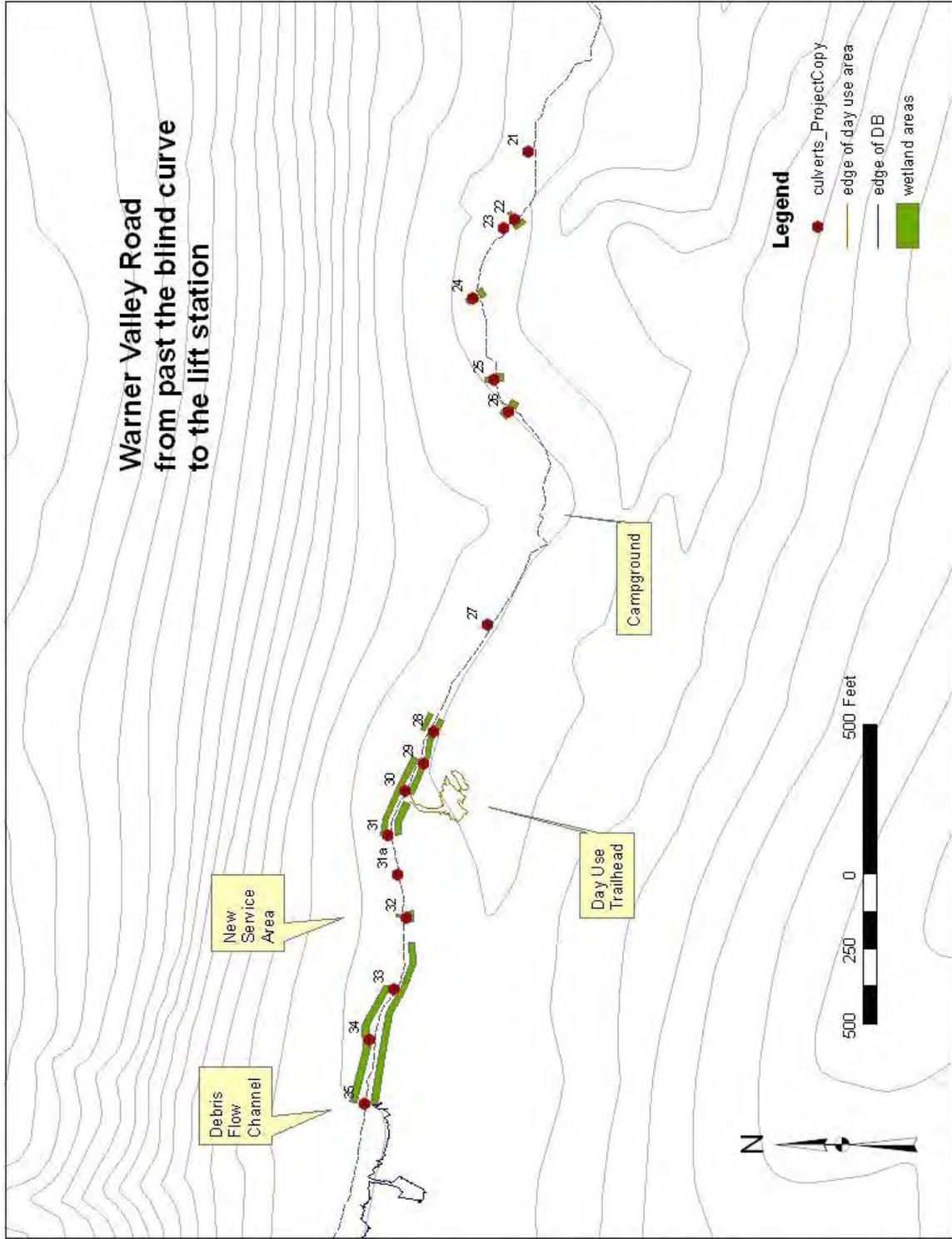
Proposed Actions Reviewed by D. Jones and L. Johnson, September 22, 2005

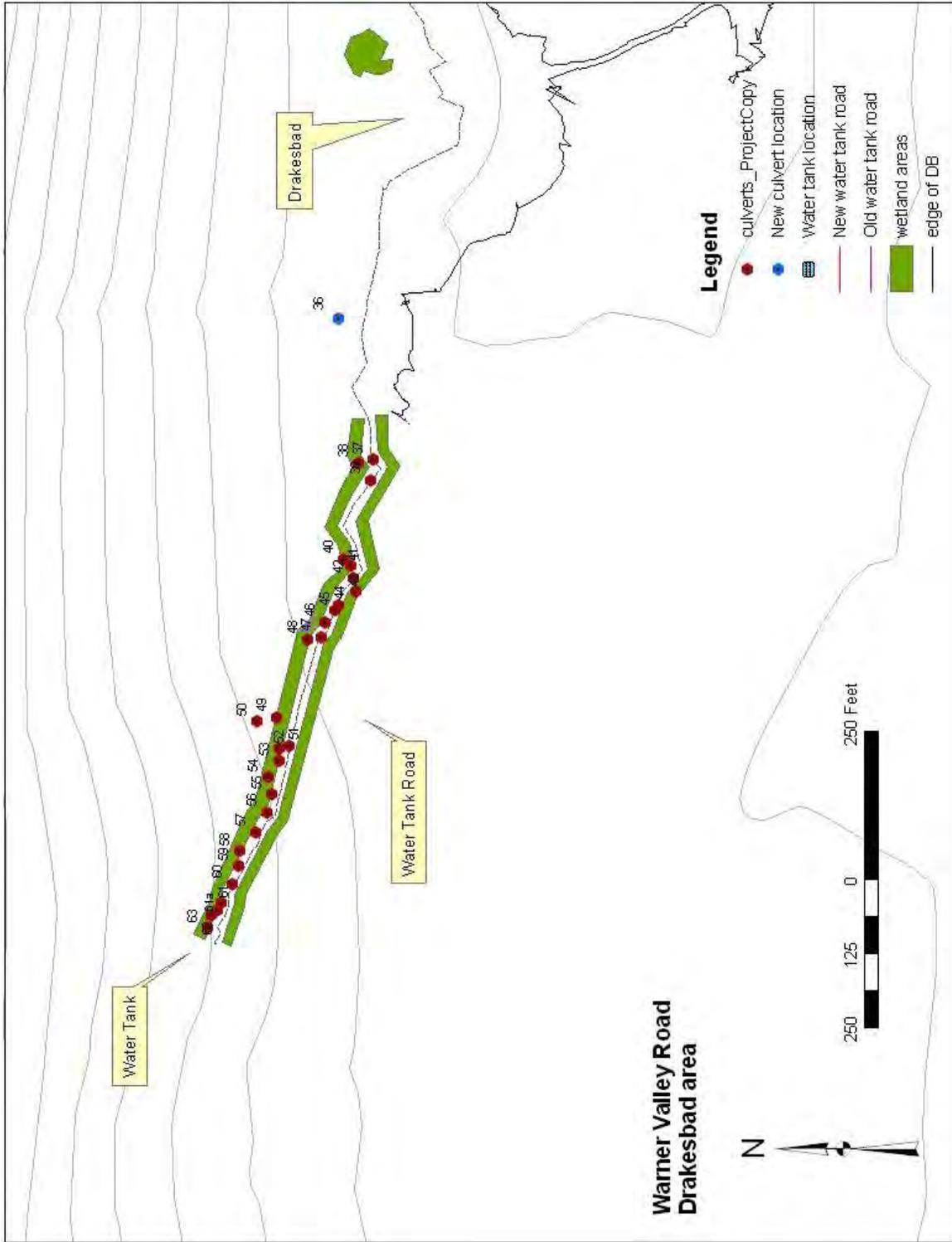
Map ID #	GPS Coordinates	Culvert Size/Type	Headwall Present	Comments	Recommended Actions
1		18" plastic	no	good condition, no drainage uphill, creek downhill	need to move woody debris out of channel
1a	need to gps	12" plastic	no	new culvert located at low point on road	none
2		18" metal	no	good condition, natural drainage	none
3		18" metal	yes, damaged	poor condition, natural drainage downhill	replace w/24" culvert, repair headwall
4		18" metal	yes	poor condition/outlet plugged (location @ burn pile)	extend existing culvert at outlet and clean outlet
5		18" metal	yes	fair condition (location at staging area/turn-around)	none
6		18" metal	yes	fair condition, natural drainage	need to clean inlet (5'x10" ephem stream); armor outlet
7		18" metal	no	long diagonal squash pipe; outlet plugged, debris	need to remove woody debris and unplug outlet
New	need to gps	12-18" plastic	n/a	long reach without culverts in ditch	install new culvert
8		12" plastic	no	fairly new road culvert, no drainage	none
9		12" plastic	no	fairly new culvert ('98), outlet at #10, natural drainage	remove woody debris from downstream channel
10		18" metal	no	fair condition, natural drainage	replace w/24" culvert; clean inlet (2'x5'); remove logs
New	already gps'd	12-18" plastic	n/a	low point in road where water ponds	install new culvert
11		18" metal	yes	fair condition, natural drainage	replace w/24" culvert; extend outlet; remove woody debris
12		18" plastic	yes	good condition ('95); overflow pipe for #13	none
13		18" metal	yes	poor condition ("iron ranger" drainage)	replace w/24" culvert; clean inlet (20'x10')
New	need to gps	18-24" plastic	n/a	wetland area only has one culvert	install 2nd culvert on east side of wetland
14		18" metal	no	fair condition, wetland/ditch area, flowing water	replace w/24" culvert; clean ditch to RS (100'x5')
15		18" metal	yes	fair condition, squash pipe, natural drainage	none
16		24" plastic	yes	good condition ('95), flowing stream, bottom of blind curve	none
New	need to gps	12-18" plastic	n/a	steep grade needs ditch culvert	install new culvert just above the blind curve
New	need to gps	12-18" plastic	n/a	steep grade needs ditch culvert	install new culvert at 15' snag tree
17		24" plastic	no	new, installed 8-24-05, drainage, minor flow	none
18		18" metal	no	fair condition, drainage with alders; minor flow	replace w/24" culvert
19		18" metal	yes	poor condition, dry drainage	need to remove woody debris up & down channel
20		18" plastic	no	good condition, fairly new, small drainage upslope	none
21		18" plastic	yes	fairly new, extends 15' downslope, no drainage	none
22		18" metal	no	poor condition, flowing stream channel	replace w/24" culvert; extend downslope 10 feet
23		18" metal	no	good condition, dry drainage	replace w/24" culvert; extend downslope 10 feet
24		18" metal	no	poor condition, minor flow in drainage	replace w/24" culvert and extension, clean outlet
25		18" metal	no	poor condition, drainage	replace w/24" culvert, clean out inlet & outlet (2'x5')
26		18" metal	no	poor condition, flowing stream channel (east of CG)	replace w/24" culvert, realign outlet 5', clean in&out
27		18" plastic	no	new pipe ('95), rock rubble headwall, oversized basin	replace large rock in inlet with headwall
28		18" metal	yes	poor condition, trickle of water, east end of wetland	replace w/24" culvert
29		18" metal	no	poor condition, outlet not visible, seepy spot in wetland	replace w/24" culvert, clean outlet (3'x5')

Following culverts are on the Drakesbad water tank road (survey completed by L. Johnson, 09/20/2005)

Map ID #	GPS Coordinates	Culvert Size/Type	Headwall Present	Comments	Recommended Actions
30		18" metal	no	poor condition, seepy area in wetland (trailhead)	replace w/24" culvert, clean inlet and outlet (3'x5')
31		12" metal	no	poor condition, alders, natural drainage	replace w/24" culvert, clean inlet and outlet (3'x5')
31a	need to gps	18" metal	no	fair condition, ditch dug below outlet, seepy area	inlet and outlet need to be cleaned out (2'x5')
32		18" metal	no	fair condition, small drainage near new service area	inlet and outlet need to be cleaned out (2'x5')
33		18" metal	no	poor condition, flat grade, east end of wetland	replace w/24" culvert, clean inlet and outlet (3'x5')
34		24" plastic	yes	good condition, fairly new, middle of wetland, flowing	none
35		60" metal	yes	5-ft squash pipe, debris flow channel, new pipe	none
36	already gps'd	none	n/a	need to install culvert at base of water tank road	culvert is needed for small drainage west of corral
37		8" plastic	no	new culvert; no flow	none
38		8" plastic	no	new culvert; trickle of water	none
39		8" plastic	no	new culvert; trickle of water	none
40		8" plastic	no	new culvert; trickle of water	none
41		8" plastic	no	new culvert; trickle of water	none
42		8" plastic	no	new culvert; flowing	none
43		8" plastic	no	new culvert; flowing	none
44		8" plastic	no	new culvert; trickle of water	none
45		8" plastic	no	new culvert; flowing	none
46		8" plastic	no	new culvert; trickle of water	none
47		8" plastic	no	new culvert; trickle of water	none
48		8" plastic	no	new culvert; trickle of water; bedrock outslope	none
49		8" plastic	no	new culvert; no flow	none
50		8" plastic	no	new culvert; no flow	none
51		8" plastic	yes (new)	new culvert; no flow	none
52		8" plastic	yes (new)	new culvert; trickle of water	none
53		8" plastic	yes (new)	new culvert; trickle of water; spring on road between 52/53	none
54		8" plastic	yes (new)	new culvert; no flow	none
55		8" plastic	yes (new)	new culvert; trickle of water	none
56		8" plastic	yes (new)	new culvert; flowing	none
57		8" plastic	yes (new)	new culvert; trickle of water	none
58		8" plastic	yes (new)	new culvert; no flow	none
59		8" plastic	yes (new)	new culvert; flowing	none
60		8" plastic	yes (new)	new culvert; no flow	none
61		8" plastic	yes (new)	new culvert; trickle of water	none
61a	gps'd	18" metal	no	fair condition, old culvert just below water tank; flowing	none
62		8" plastic	yes (new)	new culvert; flowing	none
63		8" plastic	yes (new)	new culvert; flowing	none







APPENDIX B

Biological Resources

**COMMON AND SCIENTIFIC NAMES OF
PLANTS AND ANIMALS REFERRED TO IN THIS
ENVIRONMENTAL IMPACT STATEMENT**

PLANTS

Common Name

alder
aspen
incense cedar
Jeffrey pine
lodgepole pine
red fir
sedge
sugar pine
western white pine
white fir
willow

Scientific Name

Alnus incana ssp. *tenuifolia*
Populus tremuloides
Calocedrus decurrens
Pinus jeffreyi
Pinus contorta
Abies magnifica
Carex spp.
Pinus lambertiana
Pinus monticola
Abies concolor
Salix spp.

ANIMALS

Common Name

Mammals

beaver
black bear
black-tailed deer
bobcat
broad-footed mole
chipmunk
coyote
deer mouse
Douglas' squirrel
fringed myotis
golden-mantled ground squirrel
hoary bat
long-legged myotis
montane vole
mountain lion
pine marten
pocket gopher
shrew
Sierra Nevada red fox
Sierra Nevada snowshoe hare
silver-haired bat
Yuma myotis

Scientific Name

Castor canadensis
Ursus americana
Odocoileus hemionus
Lynx rufus
Scapanus latimanus
Tamias spp.
Canis latrans
Peromyscus spp.
Tamiasciurus douglasii
Myotis thysanodes
Spermophilus lateralis
Lasiurus cinereus
Myotis volans
Microtus spp.
Felis concolor
Martes americana
Thomomys monticola
Sorex spp.
Vulpes vulpes necator
Lepus americanus
Lasionycteris noctivagans
Myotis yumanensis

Birds

American dipper
bald eagle
brown creeper
bufflehead duck
California spotted owl
Cassin's finch
common snipe
Cooper's hawk
downy woodpecker
dusky flycatcher
evening grosbeak
golden eagle
golden-crowned kinglet

Cinclus mexicanus
Haliaeetus leucocephalus
Certhia americana
Bucephala albeola
Strix occidentalis
Carpodacus cassinii
Gallinago gallinago
Accipiter cooperii
Picoides pubescens
Empidonax oberholseri
Coccothraustes vespertinus
Aquila chrysaetos
Regulus satrapa

**COMMON AND SCIENTIFIC NAMES OF
PLANTS AND ANIMALS REFERRED TO IN THIS
ENVIRONMENTAL IMPACT STATEMENT**

ANIMALS (cont.)

Common Name

Scientific Name

Birds (cont.)

greater sandhill crane
hairy woodpecker
Hammond's flycatcher
killdeer
Lincoln's sparrow
Little willow flycatcher
MacGillivray's warbler
mallard
mountain chickadee
Northern goshawk
olive-sided flycatcher
orange-crowned warbler
pileated woodpecker
red-breasted sapsucker
red-tailed hawk
rufous hummingbird
sharp-shinned hawk
song sparrow
spotted sandpiper
Steller's jay
Vaux's Swift
warbling vireo
western tanager
white-headed woodpecker
Wilson's warbler
yellow warbler

Grus canadensis
Picoides villosus
Empidonax hammondii
Charadrius vociferus
Melospiza lincolnii
Empidonax traillii brewsteri
Oporornis tolmiei
Anas platyrhynchos
Poecile gambeli
Accipiter gentilis
Contopus cooperi
Vermivora celata
Dryocopus pileatus
Sphyrapicus ruber
Buteo jamaicensis
Selasphorus rufus
Accipiter striatus
Melospiza melodia
Actitis macularia
Cyanocitta stelleri
Chaetura vauxi
Vireo gilvus
Piranga ludoviciana
Picoides albolarvatus
Wilsonia pusilla
Dendroica petechia

Fish

Brook trout
Pacific lamprey

Salvelinus fontinalis
Lampetra tridentata

**TABLE B-1
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN**

Common Name Scientific Name	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
SPECIES LISTED OR PROPOSED FOR LISTING			
Animals			
<i>Invertebrates</i>			
Shasta crayfish <i>Pacifastacus fortis</i>	FE/CE	In Pit River, Fall River, and Hat Creek drainages in Shasta County. Cool, clear, spring-fed lakes, rivers and streams, near spring inflow source. Slow to moderately flowing waters. Require volcanic rock rubble.	Low. All known occurrences of the species occur north of Cassel, CA. Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.
<i>Fish</i>			
Delta smelt <i>Hypomesus transpacificus</i>	FT/CT	Occur in the Sacramento River up to Sacramento, the Mokelumne River system, the Cache Slough Region, the Delta and the Montezuma Slough area.	Low. Located in the Sacramento – San Joaquin delta; recorded occurrences in Sacramento or Solano counties (CDFG, 2008). Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.
Central Valley steelhead <i>Oncorhynchus mykiss</i> Critical Habitat designated	FT/--	All steelhead naturally spawned in the Sacramento and San Joaquin rivers and their tributaries.	Low. Populations in the Sacramento – San Joaquin delta and their tributaries. Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.
winter-run Chinook salmon, Sacramento River <i>Oncorhynchus tshawytscha</i>	FE/CE	Spawns in Sacramento River but not its tributaries; requires clean gravel beds in cold water for spawning. Enters river in early winter months.	Low. Spawns below Keswick Dam at Lake Shasta, east of Lassen National Park. Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.
Central Valley spring-run Chinook salmon <i>Oncorhynchus tshawytscha</i> Critical Habitat designated	FT/CT	Found in Sacramento River and its tributaries. Enters river Feb-June to spawn.	Low. Range extends up to Redding, but does not reach as far east as Lassen National Park. Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.
<i>Amphibians</i>			
California red-legged frog <i>Rana aurora draytonii</i>	FT/--	Breeds in stock ponds, pools, and slow-moving streams with emergent vegetation. Aestivates in upland areas in other animal burrows.	Low. Project area outside current and historic range of California red-legged frog (FWS, 2002). Not observed in aquatic habitat surveys conducted in Lassen Volcanic National Park.

**TABLE B-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN**

Common Name <i>Scientific Name</i>	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)			
Animals (cont.)			
<i>Birds</i>			
bald eagle <i>Haliaeetus leucocephalus</i>	FD/CE/NPS	Forage over open water and nest in trees near larger waterbodies with fish.	Low. Project area offers only marginal nesting habitat for species and only one nesting pair is known to occur in the Park. May occasionally occur in the project area as a transient. Species delisted but NPS still considers a special-status species.
greater sandhill crane <i>Grus canadensis tabida</i>	--/CT	Winters in central valley, nests in wetland areas in Northeastern California. Preferable nesting site are in grain fields less than four miles from the nearest body of water.	Moderate. Breeding pair located several miles southwest of project area at Willow Lake. Potential habitat exists in wet meadows of project area and the species has been documented in Warner Valley.
willow flycatcher <i>Empidonax traillii</i>	--/CE	Nests and forages in low, dense willow thickets near the edge of wet meadows or ponds.	High. Robust breeding population identified in the Warner Valley Wildlife Area in 1996 and 2004 (CDFG, 2008).
<i>Mammals</i>			
Pacific fisher <i>Martes pennati (pacifica)</i>	FC/--	Intermediate to large tree stages of coniferous forests and deciduous riparian areas with high percent canopy closure.	Low. This species is thought to be extirpated from Lassen Volcanic National Park and typically avoid areas with human activity and development.
Sierra Nevada red fox <i>Vulpes vulpes necator</i>	--/CT	Prefer forest habitats interspersed with meadows of fell-fields. Uses rocky or densely-vegetated areas for cover.	Moderate. Sighted within Lassen National Park in many areas north of the Warner Valley; meadow habitat present in project area.
OTHER SPECIES OF CONCERN			
Animals			
<i>Fish</i>			
Central valley fall/late fall-run chinook salmon <i>Onchorhynchus tshawytscha</i>	--/CSC	Spawn in the Sacramento river and its tributaries; enters river between July-April and spawns between October and February	Low. Range extends up to Redding, but does not reach as far east as Lassen National Park.
<i>Amphibians</i>			
Cascades frog <i>Rana cascadae</i>	--/CSC	In mountain lakes, streams or ponds in meadows, and in open forests. Requires standing water to breed and hibernates in mud at bottom of lakes and ponds.	Low. Historical record in Warner Valley (CDFG, 2008), Dream Lake and riparian habitat along Hot Springs Creek could support populations of Cascades frog. However, 2004 surveys found the species at only 3 sites within the Park and NPS believes the species is close to extirpation in the region.

**TABLE B-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN**

Common Name Scientific Name	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
OTHER SPECIES OF CONCERN (cont.)			
Animals (cont.)			
<i>Reptiles</i>			
Northwestern pond turtle <i>Emmys (= Clemmys) marmorata marmorata</i>	--/CSC	Freshwater ponds and slow streams edged with sandy soils for laying eggs.	Low. Potentially suitable aquatic habitat available in Dream Lake and the species is documented historically from the Manzanita and Reflection Lake areas. However, there have been no recent sightings of this species in Lassen Volcanic National Park.
<i>Birds</i>			
northern goshawk <i>Accipiter gentilis</i>	--/CSC	Found using old nests within and around conifer forests; often on red fir, pine, and aspen trees.	Moderate. Nesting sites in red fir trees along Rice Creek less than 5 miles away; similar creek and vegetation habitat to project area.
Vaux's swift <i>Chaetura vauxi</i>	--/--/NPS	Forage for insects over rivers and lakes. Requires hollow trees and snags for nesting.	Moderate. Suitable habitat for the species occurs within and adjacent to the project area.
American dipper <i>Cinclus mexicanus</i>	--/--/NPS	Forage in clear, fast moving water. Associated with rivers and streams with rocky shores and bottoms. Nests built close to fast moving water, on crevice, cliff, or under a bridge.	High. Potentially suitable habitat occurs in Hot Springs Creek within the project area. Documented in Drakesbad Meadow mist-net surveys.
Yellow warbler <i>Dendroica petechia</i>	--/CSC	Nest in shrubby growth by swamps and watercourses, in wet scrub, tree foliage, gardens, shrubberies and berry patches.	High. Young of the year and adults documented in mist net efforts at Drakesbad Meadow sites 2000-2004.
Prairie falcon <i>Falco mexicanus</i>	--/--/NPS	Inhabit open, dry terrain and nests on covered cliff ledges.	Low. There are only historical breeding records for Lassen Volcanic National Park. No suitable breeding habitat occurs within the project area.
Rufous hummingbird <i>Selasphorus sasin</i>	--/--/NPS	Frequent scrub and riparian areas from the California coast to the mountains.	High. While the species does not breed within Lassen Volcanic National Park, high numbers of dispersing juveniles are recorded annually using riparian habitat in Drakesbad Meadow.
California spotted owl <i>Strix occidentalis occidentalis</i>	--/--/NPS	Associated with multi-storied coniferous forests with greater than 70% canopy cover. Use trees larger than 30 inches in diameter for nesting.	Moderate. There are four nesting pairs in Lassen Volcanic National Park. A non-breeding pair has been documented in Warner Valley.

TABLE B-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN

Common Name <i>Scientific Name</i>	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
OTHER SPECIES OF CONCERN (cont.)			
Animals (cont.)			
<i>Mammals</i>			
silver-haired bat <i>Laysionycteris noctivagans</i>	--/NPS	Found in montane forest areas; roosts in hollow trees underneath bark or in woodpecker holes. Feeds over nearby open water, such as rivers, lakes, and ponds	Moderate. Open water and forested habitat exists in project area; present along nearby open water like King's Creek and Willow Lake.
hoary bat <i>Lasiurus cinereus</i>	--/NPS	In open habitats or patchy habitat mosaics with cover for nesting and edges for foraging.	Moderate. Potential habitat areas like forest edges adjacent to open meadows exist in project area.
Sierra Nevada snowshoe hare <i>Lepus americanus tahoensis</i>	--/CSC/NPS	Inhabit thickets of brush, conifers, and deciduous riparian vegetation	Moderate. Known to occur in Lassen Volcanic National Park. Common but seldom seen, may occur in suitable habitat in and around Drakesbad Meadow.
fringed myotis <i>Myotis thysanodes</i>	--/--/NPS	Nests in a variety of habitats in crevices, buildings, caves, or mines. Optimal habitat includes valley hardwood, conifer hardwood, or juniper areas.	Moderate. Various buildings and hardwood conifer species could provide nesting habitat, and individuals could forage in open areas over marsh.
long-legged myotis <i>Myotis volans</i>	--/--/NPS	In woodland and forest habitats; roost in tree limbs during the day and caves and mines during at night. Nursery colonies are often in hollow trees.	Moderate. Habitat over meadow could be used for foraging; A 2002 sighting was in the upper meadow of the park, which is a similar habitat (CDFG, 2008).
Yuma myotis <i>Myotis yumanensis</i>	--/--/NPS	Nests in mines, caves, and other crevices; forages over water.	Moderate. Various buildings and hardwood conifer species could provide nesting habitat, and individuals could forage in open areas over marsh.
gray-headed pika <i>Ochotona princeps schisticepts</i>	--/NPS	Often found in talus fields above the tree line, but prefers talus-meadow interface.	Low. Historical record in Warner Valley (CDFG, 2008) from 1920's, preferred habitat not present in project area.
Sierra marten <i>Martes americana sierrae</i>	--/--/NPS	In evergreen forests with mixed-aged stands and greater than 40% crown closure; requires snags and tree cavities for nesting.	Low. Requires expansive densely-forested areas; much of Warner Valley is open meadow or riparian habitat. Shows a preference for old growth conifers and snags.
American badger <i>Taxidea taxus</i>	--/CSC	Resides in burrows in dry, open shrubland and forest areas with friable soils.	Low. Historical record in Warner Valley (CDFG, 2008); suitable burrowing soils and open foraging areas are not present in entirety of project area.

TABLE B-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN

Common Name Scientific Name	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
OTHER SPECIES OF CONCERN (cont.)			
Plants			
upswept moonwort <i>Botrychium ascendens</i>	--/--/2.3	Along streams in lower montane coniferous forests and meadows and seeps	Moderate. Known population several miles southeast near Domingo Lake (CDFG, 2008).
mingan moonwort <i>Botrychium minganense</i>	--/--/2.2	On creekbanks in upper and lower montane coniferous forests, bogs and fens	Moderate. Known population several miles southeast near Domingo Lake (CDFG, 2008).
western goblin <i>Botrychium montanum</i>	--/--/2.1	Along streams in upper and lower montane coniferous forests, bogs and fens	Moderate. Known population several miles southeast near Domingo Lake (CDFG, 2008).
northwestern moonwort <i>Botrychium pinnatum</i>	--/--/2.3	Upper and lower montane coniferous forests, bogs and fens; along creekbanks.	Moderate. Population along Domingo springs southwest of Domingo Lake. (CDFG, 2008).
Bruchia moss <i>Bruchia bolanderi</i>	--/--/2.2	Damp and often disturbed soils in lower and upper montane coniferous forest, meadows and seeps	High. Documented as occurring at the southeast Ranger station of Lassen Volcanic National park.
wooly-fruited sedge <i>Carex lasocarpa</i>	--/--/2.3	Present in bogs and fens as well as marshes and swamps	Moderate. Populations located at several lakes to the southeast of the project area.
mud sedge <i>Carex limosa</i>	--/--/2.3	In upper montane forests as well as bogs, fens, marshes, and swamps. Grows on floating bogs, soggy meadows, and at edges of lakes.	High. Present east of Drakesbad in Warner Valley near Kelly Camp, also at Willow Lake.
English sundew <i>Drosera anglica</i>	--/--/2.3	In bogs and fens as well as meadows and seeps.	Moderate. Present in Domingo lake, Willow Lake, and Little Willow lake, all southeast of Warner Valley.
marsh willowherb <i>Epilobium plaustrae</i>	--/--/2.3	In bogs and fens as well as meadows and seeps.	Moderate. Present near Warner Valley in boggy areas of Willow Lake.
snow fleabane daisy <i>Erigeron nivalis</i>	--/--/2.3	Found in alpine boulder and rock fields or rocky volcanic areas, subalpine coniferous forests, and meadows and seeps.	Low. On slopes of Lassen and surrounding higher elevation areas in predominantly rocky habitats.
tall alpine aster <i>Oreostemma elatum</i>	--/--/1B.2	Present in upper montane coniferous forests, bogs and fens, and meadows and seeps.	Moderate. Has been located in similar habitat areas west of the Warner Valley.
rayless mountain ragwort <i>Packera indecora</i>	--/--/2.2	Found in meadows and seeps.	Low. No known occurrences in meadow habitats near project area.
white-stemmed pondweed <i>Potamogeton praelongus</i>	--/--/2.3	Found in marshes and swamps, deep water lakes.	Moderate. Known occurrence in deeper areas of Willow lake; may occur at Dream Lake within the project area.

**TABLE B-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN EVALUATION OF WARNER VALLEY
COMPREHENSIVE SITE PLAN**

Common Name Scientific Name	Listing Status USFWS/ CDFG/ CNPS/NPS	General Habitat	Potential for Species Occurrence Within Project Area of Impact
OTHER SPECIES OF CONCERN (cont.)			
Plants (cont.)			
white-beaked rush <i>Rhynchospora alba</i>	--/--/2.2	Present in riparian areas like bogs, fen, marshes, swamps, meadows, or seeps.	Moderate. Present on floating sphagnum bogs on Willow Lake and Little Willow lake several miles southeast of project area.
American scheuchzeria <i>Scheuchzeria palustris</i> var. <i>americana</i>	--/--/2.1	In bogs and fens as well as marshes and swamps; can be around lake margins	Moderate. Present in both Willow and Domingo lakes several miles southeast of project area.
water bulrush <i>Schoenoplectus subterminalis</i>	--/--/2.3	In bogs and fens as well as marshes and swamps; can be around montane lake margins	Moderate. Present in Little Willow lake southeast of project area.
flat-leaved bladderwort <i>Utricularia intermedia</i>	--/--/2.2	In bogs and fens as well as marshes and swamps; can be around lake margins	High. Present at south end of Warner Valley Road in wet bog habitat, similar to habitats within Warner Valley.
cream-flowered bladderwort <i>Utricularia ochroleuca</i>	--/--/2.2	Found in meadows and seeps as well as marshes and swamps	Moderate. Present in marsh habitat at Willow lake, several miles southeast of the project area. May occur in Dream Lake.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.

FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.

FC = Candidate to become a *proposed* species.

FD = Federal Delisted

NPS = Species of Park Concern

STATE: (California Department of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CSC = California Species of Special Concern

California Native Plant Society

List 1B=Plants rare, Threatened, or Endangered in California and elsewhere

List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere

An extension reflecting the level of threat to each species is appended to each rarity category as follows:

.1 – Seriously endangered in California

.2 – Fairly endangered in California

.3 – Not very endangered in California

References

- California Department of Fish and Game (CDFG), Wildlife Habitat and Data Analysis Branch, *California Natural Diversity Database*, data request for the Mt. Harkness and Reading Peak 7.5-minute USGS topographic quadrangles. Commercial version 3.0.5, 08/31/08.
- California Native Plant Society (CNPS), *Electronic Inventory of Rare and Endangered Plants of California, Version 7-06a 1-24-06*, data request for the Mt. Harkness and Reading Peak 7.5-minute USGS topographic quadrangles. Available online at: <http://www.cnps.org/inventory>, accessed October 3, 2008.
- National Park Service (NPS), *Lassen Volcanic National Park: Summary of Monitoring Activities for 2003-2004*, April, 2005.
- NPS, *Lassen Volcanic National Park Weed Management Plan and Environmental Assessment*, March 2008.
- U.S. Fish and Wildlife Service (USFWS), 1995. *Sacramento-San Joaquin Delta Native Fishes Recovery Plan*. U.S. Fish and Wildlife Service, Portland, Oregon.
- USFWS, 2002, *Recovery plan for the California red-legged frog (Rana aurora dratonyii)*. U.S. Fish and Wildlife Service, Portland, Oregon.
- USFWS. *Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Mt. Harkness and Reading Peak U.S.G.S. 7 1/2 Minute Quads*, Document Number: 081003030542, Database Last Updated: January 31, 2008, Accessed online October 3, 2008.



United States Department of the Interior
FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825



October 3, 2008

Document Number: 081003030542

Subject: Species List for Warner Valley

Dear: Interested party

We are sending this official species list in response to your October 3, 2008 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 01, 2009.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division



**Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the Counties and/or
U.S.G.S. 7 1/2 Minute Quads you requested**

Document Number: 081003030542

Database Last Updated: January 31, 2008

Quad Lists

Listed Species

Invertebrates

Pacifastacus fortis

Shasta crayfish (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Rana aurora draytonii

California red-legged frog (T)

Candidate Species

Mammals

Martes pennanti

fisher (C)

Quads Containing Listed, Proposed or Candidate Species:

MT. HARKNESS (625A)

READING PEAK (625B)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the [National Oceanic & Atmospheric Administration Fisheries Service](http://www.nmfs.gov). Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online [Inventory of Rare and Endangered Plants](#).

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the [Guidelines for Conducting and Reporting Botanical Inventories](#). The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal [consultation](#) with the Service.

During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and

proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as [critical habitat](#). These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our [critical habitat page](#) for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. [More info](#)

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January

01, 2009.

California Department of Fish and Game
 Natural Diversity Database
 Mt. Harkness and Reading Peak Quads

Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1 <i>Accipiter gentilis</i>	northern goshawk	ABNKC12060			G5	S3		SC
2 <i>Botrychium ascendens</i>	upswept moonwort	PPOPH010S0			G2G3	S1.3?	2.3	
3 <i>Botrychium minganense</i>	mingan moonwort	PPOPH010R0			G4	S1.2	2.2	
4 <i>Botrychium montanum</i>	western goblin	PPOPH010K0			G3	S1.1	2.1	
5 <i>Botrychium pinnatum</i>	northwestern moonwort	PPOPH010V0			G4?	S1.3?	2.3	
6 <i>Bruchia bolanderi</i>	Bolander's bruchia	NBMUS13010			G3	S2.2	2.2	
7 <i>Carex lasiocarpa</i>	woolly-fruited sedge	PMCYP03720			G5	S1.3?	2.3	
8 <i>Carex limosa</i>	mud sedge	PMCYP037K0			G5	S3?	2.2	
9 <i>Draba aureola</i>	golden alpine draba	PDBRA110F0			G4	S1.3	1B.3	
10 <i>Drosera anglica</i>	English sundew	PDDRO02010			G5	S2S3	2.3	
11 <i>Eccლისomyia bilera</i>	Kings Creek eccლისomyian caddisfly	IITRI12010			G1G2	S1S2		
12 <i>Empidonax traillii</i>	willow flycatcher	ABPAE33040		Endangered	G5	S1S2		
13 <i>Epilobium palustre</i>	marsh willowherb	PDONA060R0			G5	S1.3	2.3	
14 <i>Erigeron nivalis</i>	snow fleabane daisy	PDASTE1060			G4G5	S2S3	2.3	
15 <i>Eriogonum pyrolifolium</i> var. <i>pyrolifolium</i>	pyrola-leaved buckwheat	PDPGN084Z2			G4T4	S2.3	2.3	
16 <i>Grus canadensis tabida</i>	greater sandhill crane	ABNMK01014		Threatened	G5T4	S2		SC
17 <i>Hulsea nana</i>	little hulsea	PDAST4Z060			G4	S2.3	2.3	
18 <i>Lasionycteris noctivagans</i>	silver-haired bat	AMACC02010			G5	S3S4		
19 <i>Lasiorus cinereus</i>	hoary bat	AMACC05030			G5	S4?		
20 <i>Martes americana sierrae</i>	Sierra marten	AMAJF01014			G5T3T4	S3S4		
21 <i>Martes pennanti (pacifica) DPS</i>	Pacific fisher	AMAJF01021	Candidate		G5	S2S3		SC
22 <i>Meesia triquetra</i>	three-ranked hump moss	NBMUS4L020			G5	S3S4.2	4.2	
23 <i>Mielichhoferia tehamensis</i>	Lassen Peak copper moss	NBMUS4Q030			G1	S1.3	1B.3	
24 <i>Myotis thysanodes</i>	fringed myotis	AMACC01090			G4G5	S4		
25 <i>Myotis volans</i>	long-legged myotis	AMACC01110			G5	S4?		
26 <i>Myotis yumanensis</i>	Yuma myotis	AMACC01020			G5	S4?		
27 <i>Ochotona princeps schisticeps</i>	gray-headed pika	AMAEA0102H			G5T2T4	S2S4		
28 <i>Oreostemma elatum</i>	tall alpine-aster	PDASTEAO20			G2Q	S2.2	1B.2	
29 <i>Packera indecora</i>	rayless mountain ragwort	PDAST8H1R0			G5	S1.2	2.2	
30 <i>Parapsyche extensa</i>	King's Creek parapsyche caddisfly	IITRI26010			GH	SH		
31 <i>Potamogeton praelongus</i>	white-stemmed pondweed	PMPOT030V0			G5	S1S2	2.3	
32 <i>Rana cascadae</i>	Cascades frog	AAABH01060			G3G4	S3		SC
33 <i>Rhynchospora alba</i>	white beaked-rush	PMCYP0N010			G5	S3.2	2.2	
34 <i>Scheuchzeria palustris</i> var. <i>americana</i>	American scheuchzeria	PMSCH02011			G5T5	S1.1	2.1	
35 <i>Schoenoplectus subterminalis</i>	water bulrush	PMCYP0Q1G0			G4G5	S2S3	2.3	
36 <i>Silene suksdorfii</i>	Cascade alpine campion	PDCAR0U1W0			G4	S2.3	2.3	

California Department of Fish and Game
 Natural Diversity Database
 Mt. Harkness and Reading Peak Quads

Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
37 <i>Smelowskia ovalis</i> var. <i>congesta</i>	Lassen Peak smelowskia	PDBRA2D041			G5T1	S1.2	1B.2	
38 <i>Sphagnum Bog</i>	Sphagnum Bog	CTT51110CA			G3	S1.2		
39 <i>Stellaria obtusa</i>	obtuse starwort	PDCAR0X0U0			G5	S3.3	4.3	
40 <i>Taxidea taxus</i>	American badger	AMAJF04010			G5	S4		SC
41 <i>Utricularia intermedia</i>	flat-leaved bladderwort	PDLNT020A0			G5	S2.2	2.2	
42 <i>Utricularia ochroleuca</i>	cream-flowered bladderwort	PDLNT020E0			G4?	S1.2	2.2	
43 <i>Vulpes vulpes necator</i>	Sierra Nevada red fox	AMAJA03012		Threatened	G5T3	S1		

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 23 items - Fri, Oct. 3, 2008, 15:52 b

Reformat list as:

ECOLOGICAL REPORT

scientific	family	life form	blooming	communities	elevation	CNPS
<u>Botrychium ascendens</u>	Ophioglossaceae	perennial rhizomatous herb	Jul-Aug	<ul style="list-style-type: none"> •Lower montane coniferous forest (LCFrS) •Meadows and seeps (Medws)/mesic 	1500 - 2285 meters	List 2.3
<u>Botrychium manganense</u>	Ophioglossaceae	perennial rhizomatous herb	Jul-Sep	<ul style="list-style-type: none"> •Bogs and fens (BgFns) •Lower montane coniferous forest (LCFrS) •Upper montane coniferous forest (UCFrS)/mesic 	1455 - 2055 meters	List 2.2
<u>Botrychium montanum</u>	Ophioglossaceae	perennial rhizomatous herb	Jul-Sep	<ul style="list-style-type: none"> •Lower montane coniferous forest (LCFrS) •Meadows and seeps (Medws) •Upper montane coniferous forest (UCFrS)/mesic 	1500 - 2130 meters	List 2.1
<u>Botrychium pinnatum</u>	Ophioglossaceae	perennial rhizomatous herb	Jul-Oct	<ul style="list-style-type: none"> •Lower montane coniferous forest (LCFrS) •Meadows and seeps (Medws) •Upper montane coniferous forest (UCFrS)/mesic 	1770 - 2040 meters	List 2.3
<u>Bruchia bolanderi</u>	Bruchianaceae	moss		<ul style="list-style-type: none"> •Lower montane coniferous forest (LCFrS) •Meadows and seeps (Medws) •Upper montane coniferous forest (UCFrS)/damp soil 	1700 - 2800 meters	List 2.2
<u>Carex lasiocarpa</u>	Cyperaceae	perennial rhizomatous herb	Jun-Jul	<ul style="list-style-type: none"> •Bogs and fens (BgFns) •Marshes and swamps (MshSw) (freshwater, lake margins) 	1800 - 2100 meters	List 2.3
<u>Carex limosa</u>	Cyperaceae	perennial rhizomatous herb	Jun-Aug	<ul style="list-style-type: none"> •Bogs and fens (BgFns) •Lower montane coniferous forest (LCFrS) •Meadows and seeps (Medws) •Marshes and 	1200 - 2700 meters	List 2.2

				swamps (MshSw) •Upper montane coniferous forest (UCFRs)		
<u>Draba aureola</u>	Brassicaceae	perennial herb	Jul-Aug	•Alpine boulder and rock field (AlpBR) •Subalpine coniferous forest (SCFRs)/serpentinite or volcanic	2000 - 3355 meters	List 1B.3
<u>Drosera anglica</u>	Droseraceae	perennial herb carnivorous	Jun-Sep	•Bogs and fens (BgFns) •Meadows and seeps (Medws) (mesic)	1300 - 2000 meters	List 2.3
<u>Epilobium palustre</u>	Onagraceae	perennial rhizomatous herb	Jul-Aug	•Bogs and fens (BgFns) •Meadows and seeps (Medws) (mesic)	2200 - 2200 meters	List 2.3
<u>Erigeron nivalis</u>	Asteraceae	perennial herb	Jul-Aug	•Alpine boulder and rock field (AlpBR) •Meadows and seeps (Medws) •Subalpine coniferous forest (SCFRs)/volcanic, rocky	1735 - 2900 meters	List 2.3
<u>Hulsea nana</u>	Asteraceae	perennial herb	Jul-Aug	•Alpine boulder and rock field (AlpBR) •Subalpine coniferous forest (SCFRs)/rocky or gravelly, volcanic	1720 - 3355 meters	List 2.3
<u>Meesia uliginosa</u>	Meesiaceae	moss	Oct	•Bogs and fens (BgFns) •Meadows and seeps (Medws) •Subalpine coniferous forest (SCFRs) •Upper montane coniferous forest (UCFRs)/damp soil	1300 - 2804 meters	List 2.2
<u>Mielichhoferia tehamensis</u>	Bryaceae	moss	•Alpine boulder and rock field (AlpBR) (volcanic, mesic, rock and soil)	2500 - 2800 meters	List 1B.3	
<u>Oreostemma elatum</u>	Asteraceae	perennial herb	Jun-Aug	•Bogs and fens (BgFns) •Meadows and seeps (Medws) •Upper montane coniferous forest (UCFRs)/mesic	1005 - 2100 meters	List 1B.2
<u>Potamogeton praelongus</u>	Potamogetonaceae	perennial rhizomatous herb aquatic	Jul-Aug	•Marshes and swamps (MshSw) (deep water, lakes)	1800 - 3000 meters	List 2.3
<u>Rhynchospora alba</u>	Cyperaceae	perennial rhizomatous herb	Jul-Aug	•Bogs and fens (BgFns) •Meadows and seeps (Medws) •Marshes and swamps (MshSw)	60 - 2040 meters	List 2.2

				(freshwater)		
<u>Scheuchzeria palustris</u> var. <u>americana</u>	Scheuchzeriaceae	perennial rhizomatous herb emergent	Jul-Aug	•Bogs and fens (BgFns) •Marshes and swamps (MshSw) (lake margins)	1370 - 2000 meters	List 2.1
<u>Schoenoplectus subterminalis</u>	Cyperaceae	perennial rhizomatous herb aquatic	Jun-Aug	•Bogs and fens (BgFns) •Marshes and swamps (MshSw) (montane lake margins)	750 - 2250 meters	List 2.3
<u>Silene suksdorfii</u>	Caryophyllaceae	perennial herb	Jul-Sep	•Alpine boulder and rock field (AlpBR) •Subalpine coniferous forest (SCFRs) •Upper montane coniferous forest (UCFRs)/volcanic, rocky	2355 - 3110 meters	List 2.3
<u>Smelowskia ovalis</u> var. <u>congesta</u>	Brassicaceae	perennial herb	Jul-Aug	•Alpine boulder and rock field (AlpBR)	2440 - 3100 meters	List 1B.2
<u>Utricularia intermedia</u>	Lentibulariaceae	perennial stoloniferous herb aquatic carnivorous	Jul-Aug	•Bogs and fens (BgFns) •Meadows and seeps (Medws) (mesic) •Marshes and swamps (MshSw) (lake margins)	1200 - 2700 meters	List 2.2
<u>Utricularia ochroleuca</u>	Lentibulariaceae	perennial stoloniferous herb	Jun-Jul	•Meadows and seeps (Medws) (mesic) •Marshes and swamps (MshSw) (lake margins)	1435 - 1440 meters	List 2.2