

# Chapter 3: Affected Environment and Environmental Consequences

## Introduction

This chapter describes the environment that could be affected by the alternatives of the Badger Pass Ski Lodge Rehabilitation Project, and analyzes the potential environmental impacts of the proposed actions in each alternative.

### **Organization of this Chapter**

This chapter includes an introduction that provides a brief overview of the resource topics analyzed and the methods used for analysis. A rationale for excluding certain resource topics is also included. Following the introduction, this chapter is organized by resource topics relevant to the project. Descriptions of the current conditions of each resource topic, based on the most recent studies and analyses, are described in the Affected Environment sections. The Affected Environment sections are followed by an analysis of the Environmental Consequences associated with each proposed alternative, including the No Action Alternative. These analyses provide the basis for comparing the effects of the alternatives.

### **Resource Topics Considered in this Environmental Assessment**

Resource topics considered were selected based on federal law, regulations, executive orders, NPS management policies, NPS subject matter expertise, and concerns expressed by other agencies or members of the public during scoping and comment periods.

#### **Natural Resources**

The federal and state Endangered Species Acts (and associated legislation), Clean Water Act, Clean Air Act, and National Environmental Policy Act (NEPA) require that the effects of any federal undertaking on natural resources be examined. In addition, NPS management policies and natural resource management guidelines call for the consideration of natural resources in planning proposals. As a result, analysis was performed for the following natural and physical resource topics:

- Soils
- Hydrology and water quality
- Wetlands
- Vegetation
- Wildlife
- Special status species
- Air quality
- Soundscapes

## **Sociocultural Resources**

Sociocultural resources are cultural resources associated with the relationship of people with the human environment (both biophysical and built). These cultural resources may have historic merit, but do not qualify as historic properties (see below). They include resources protected under the American Indian Religious Freedom Act and Executive Order 13007, which protect American Indian traditional religious practices and sacred sites. Based on the 1916 Organic Act, stewardship of Yosemite National Park requires consideration of two integrated purposes: (1) to preserve Yosemite's unique natural and cultural resources and scenic beauty; and (2) to make these resources available to visitors for study, enjoyment, and recreation. Conserving the park's scenery is a crucial component of the 1916 Organic Act and the park's enabling legislation. To meet NPS obligations under the National Environmental Policy Act, it is necessary to characterize the sociocultural environment, and to analyze the potential effects of the Badger Pass Ski Lodge Rehabilitation Project on these resources. As a result, analysis was performed for the following sociocultural resource topics:

- Visitor experience and recreation
- Visitor services
- Facilities operations and management
- Transportation
- Energy consumption and global climate change
- American Indian traditional cultural practices

## **Historic Properties**

Cultural resources that are eligible for listing in the National Register of Historic Places are considered Historic Properties and are protected under the National Historic Preservation Act (NHPA). Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. The 1999 Programmatic Agreement (NPS 1999) governs the park's effort to take into account the effects of park planning and operations on historic properties. In addition, NPS management policies and cultural resource management guidelines call for the consideration of historic properties in planning proposals. For this project, analysis was performed for the following historic properties resource topics:

- Historic sites, buildings, and cultural landscapes

## **Resource Topics Dismissed From Detailed Analysis**

**Geology and Geologic Hazards:** There are no geologic resources that would be affected by any of the proposed actions. The project site and its vicinity are located in an area of relatively low historic seismic activity. There are no known faults that cut through the local soils in or near the site, and the site is not located in an Alquist-Priolo Earthquake Fault Zone as defined by Special Publication 42 (revised 1994) published by the California Geologic Survey (Kleinfelder 2010). The results of geotechnical investigations at the site and the impact of seismic retrofitting to code are addressed under the Soils section. Therefore, these resource topics have dismissed from further analysis in this document.

**Floodplains:** The project area does not overlap with any floodplains, and the proposed actions would not have any indirect effects to other known floodplains. Therefore, this resource topic has been dismissed from further analysis in this document.

**Lightscares:** Night skies in the project area are subject to stray artificial light from the nearby Central Valley of California. Sky quality measurements taken in 2005 from Sentinel Dome, located west of Glacier Point on the rim of Yosemite Valley, indicate that the night skies in the western portion of the park, including the project area, are affected by ‘sky glow’ from several Central Valley cities, including Fresno, and the Modesto/Stockton/Sacramento area.

Safety and security around the developed area at Badger Pass are accommodated through limited lighting. The Badger Pass Ski Lodge and associated buildings are lit at the building entrances and loading areas. Several overhead lights establish routes between buildings to assure a safe environment for employees and visitors. There would be only minimal changes to exterior lighting at the ski lodge under this project, and any changes to would be in accordance with park lighting guidelines. Any impacts from lighting modifications on wildlife are noted in the Wildlife section of this analysis. There would be no impacts on the visitor experience due to changes in lighting, since visitor use of the area is limited to day use. Therefore, this topic has been dismissed from further analysis in this document.

**Prime and Unique Agricultural Lands:** There are no agricultural lands in the project area, and the proposed action would not have any indirect effects to downstream agricultural lands. Therefore, this resource topic has been dismissed from further analysis in this document.

**Scenic Resources:** There would be no changes to scenic views from the ski lodge, and the changes to scenic views towards the ski lodge are analyzed under Historic Properties. Impacts on scenic resources are addressed under the Historic Districts, Buildings, and Cultural Landscapes section and the Visitor Experience section. Although the Winter Club Room is removed in Alternatives 3 and 4, reducing access to views from this vantage point, this reduction of access is countered with more open deck space to view the slopes. Therefore, this topic has been dismissed from further analysis as a separate resource topic in this document.

**Wilderness Experience:** The project area does not overlap with designated wilderness. Visitors would still be able to access surrounding designated wilderness from the Badger Pass Ski Area parking lot and the ski area itself, and would continue to rent equipment at the ski lodge to use in adjacent wilderness (e.g., Nordic skis or snowshoes). Because the Badger Pass Ski Lodge Rehabilitation Project does not propose to change the amounts or types of visitor use at the ski area, implementation of this project would not have any effect on the wilderness experience or wilderness access. Therefore, this resource topic has been dismissed from further analysis in this document.

**Orientation and Interpretation:** Implementation of the Badger Pass Ski Lodge Rehabilitation Project could have minor effects on park orientation and interpretation, due to the potential installation of new signs and/or interpretive displays in or around the ski lodge. Any additions or changes would be minor and would not affect overall park orientation and interpretation. Proposed actions of this type are addressed under the Visitor Services and Facilities Operations and Management sections. Therefore, this topic has been dismissed from further analysis as a separate resource topic in this document.

**Public Health and Safety:** Public Health and Safety is not presented as a separate topic in this plan because several resource topic sections (including Visitor Services and Facilities Management and Operations) evaluate park-related public health and safety issues such as fire safety and structural safety improvements to the ski lodge. Implementation of this project would cause no change in levels or types of public safety services offered at the ski area. Therefore, this topic has been dismissed from further analysis as a separate resource topic in this document.

**Environmental Justice:** No aspect of the alternatives of the Badger Pass Ski Lodge Rehabilitation Project would result in disproportionately high and adverse human health or environmental effects on minority or low-income populations; destruction or disruption of community cohesion and economic vitality; displacement of public and private facilities and services; increased traffic congestion; and/or exclusion or separation of minority or low-income populations from the broader community. Therefore, this resource topic has been dismissed from further analysis in this document.

**Land Use:** Land uses within Yosemite National Park are classified as “parklands,” regardless of the individual types of land uses within the park. Implementation of the Badger Pass Ski Lodge Rehabilitation Project would not affect parkland land uses within the park. Therefore, this resource topic has been dismissed from further analysis in this document.

**Socioeconomics:** There would be no measurable effects to the regional or gateway community economies, or changes in visitor attendance or visitor spending patterns as a result of implementation of the Badger Pass Ski Lodge Rehabilitation Project. Therefore, this resource topic has been dismissed from further analysis in this document.

**Archeological Resources:** Previous archeological surveys conducted have indicated that there are no known archeological resources within the project area. Therefore no impacts on archeological resources are expected to result from the proposed action. In the unexpected event that previously unidentified archeological deposits are exposed during ground disturbance, the 1999 Programmatic Agreement would be implemented.

**American Indian Traditional Cultural Properties:** Although the Badger Pass/Monroe Meadow area is regarded by the associated American Indian tribes as a location with traditional associations, there is no adequate information to indicate that the project area is eligible as a Traditional Cultural Property. This resource topic has been dismissed from further analysis in this document. Potential impacts on traditional cultural resources are addressed under the American Indian Traditional Cultural Practices section.

**Museum Collections and Objects:** Implementation of the Badger Pass Ski Lodge Rehabilitation Project could indirectly affect the museum collections by generating minimal additions to the collections due to the unlikely need for archeological data recovery performed as mitigation for direct site impacts at select locations. Such additions would require museum storage space and ongoing collection maintenance and management. Any efforts associated with this are expected to be minimal and undertaken as part of routine collection duties associated with the maintenance of the museum collection. Therefore, this resource topic has been dismissed from further analysis in this document.

## **Methods for Analyzing Environmental Consequences**

The National Environmental Policy Act requires that environmental documents disclose the environmental impacts of a proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. The National Environmental Policy Act and NPS *Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making* (DO-12) (NPS 2001) require consideration of the context, duration, intensity, and type of impacts. Effects to historic properties are analyzed using ACHP regulations.

Both direct and indirect impacts of the action must be included in the analysis. Direct impacts are caused by, and occur at the same time and place as the action, including such impacts as animal and plant mortality and damage to cultural resources. Indirect impacts are caused by the action, but occur later in time at another place or to another resource, including changes in species composition, vegetation structure, range of wildlife, offsite erosion or changes in general economic conditions tied to park activities. In addition, potential cumulative impacts caused by the project in combination with other actions, and potential impairment of park resources and values are considered.

### **Impact Analysis - General**

The environmental consequences for each impact topic were defined based on the following information regarding context, type of impact, duration of impact, intensity of impact and the cumulative context. Unless otherwise stated, impact analysis is based on a qualitative assessment of impacts. Context, duration, type and intensity of impact are characterized in more detail specific to each resource topic, when applicable, preceding the environmental consequences discussion in each resource section below.

#### **Context of Impact**

Setting or area within which impacts are analyzed – such as the local project area, the region, or national area of influence.

- *Local:* Detectable only in the vicinity of the proposed action.
- *Regional:* Detectable on a landscape scale (beyond the affected site).
- *National:* Detectable on a national scale.

#### **Duration of Impact**

Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts evaluated in this environmental assessment may be one of the following:

- *Short-term:* Generally, short-term impacts are temporary, transitional and associated with construction and removal activities.
- *Long-term:* Long-term impacts are typically those effects that continue to occur after construction and last 10 years or more and could be considered permanent.

#### **Intensity of Impact**

The intensity of an impact considers whether the impact is judged negligible, minor, moderate, or major relative to existing conditions. Intensity of impact for special status species and historic properties are measured differently, and are described below.

- *Negligible*: The measurable or anticipated degree of change would not be detectable or would be only slightly detectable, localized or at the lowest level of detection.
- *Minor*: The measurable or anticipated degree of change would have a slight effect, causing a slightly noticeable change of approximately less than 20 percent compared to existing conditions, often localized.
- *Moderate*: The measurable or anticipated degree of change is readily apparent and appreciable and would be noticed by most people, with a change likely to be between 21 and 50 percent compared to existing conditions; can be localized or widespread.
- *Major*: The measurable or anticipated degree of change would be substantial, causing a highly noticeable change of approximately greater than 50 percent compared to existing conditions; often widespread.

### **Type of Impact**

A measure of whether the impact would improve or harm the resource and whether that harm occurs immediately or at some later point in time.

- *Beneficial*: Reduces or improves impact being discussed.
- *Adverse*: Increases or results in negative impact being discussed.

### **Impact Analysis for Special Status Species**

Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure their actions would not jeopardize the continued existence of any federally listed or proposed threatened or endangered species, or adversely modify designated or proposed critical habitat (Endangered Species Act Section 7 (a) (2)). If listed species or their critical habitat are present, the federal agency must determine if the action would have “no effect,” “may effect, not likely to adversely affect,” or “may effect, likely to adversely affect” those species or their habitat. The National Park Service makes the determination of effect for the alternatives following guidance outlined in the 1998 U.S. Fish and Wildlife Service and National Marine Fisheries Service *Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conference Activities*. Although special status species include state listed and sensitive species, park sensitive species, and species with other federal (i.e., Bureau of Land Management or Forest Service sensitive), state or local special status, in addition to species protected under the Endangered Species Act, impacts are determined following the same guidance.

- *No Effect*: The project (or action) is located outside suitable habitat and there would be no disturbance or other direct, indirect, or cumulative impacts on the species. The action would not affect the listed species or its designated critical habitat (USFWS 1998).
- *May Affect, Not Likely to Adversely Affect*: The project (or action) occurs in suitable habitat or results in indirect impacts on the species, but the effect on the species is likely to be entirely beneficial, discountable, or insignificant. The action may pose effects on listed species or designated critical habitat but given circumstances or mitigation conditions, the effects may be discounted, insignificant, or completely beneficial. Insignificant effects would not result in take. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur (USFWS 1998).
- *May Affect*: The project (or action) would have an adverse effect on a listed species as a direct, indirect, or cumulative result of the proposed action or its interrelated or interdependent actions and the effect is not: discountable, insignificant, or beneficial (USFWS 1998).

## Impact Analysis for Historic Properties

“Historic properties,” as defined by the implementing regulations of the National Historic Preservation Act, are any districts, buildings, structures, sites, or objects, including resources that are considered by American Indians to have cultural and religious significance, that are eligible for inclusion in the National Register of Historic Places (NRHP) because they are significant at the national, state, or local level in American history, architecture, archeology, engineering, or culture. The term “eligible for inclusion” includes both properties formally determined eligible and all other properties that meet NRHP listing criteria. The Badger Pass Ski Area is a NRHP-eligible historic site that derives its significance at the local level under National Register Criterion A - (Event) in the areas of Entertainment/Recreation and the context of Tourism, Recreation and Preservation Ethic, as one of California’s earliest developed downhill ski areas. The Badger Pass Ski Lodge is considered a significant contributing feature to the historic site (Page & Turnbull 2009e).

NPS management policies and cultural resource management guidelines call for the consideration of historic properties in planning proposals. To meet NPS obligations under the National Historic Preservation Act and the National Environmental Policy Act, among other regulations, methods for identifying historic properties and assessing impacts must meet the standards in NHPA section 106 implementing regulations (36 CFR 800).

### NHPA Determinations of Effect

Conventional terms used by the National Park Service to measure the context, duration, intensity, and type of impact as part of NEPA analysis are not valid for assessing effects on historic properties under NHPA standards. Because the effect on a historic property is measured by the status of the historic property’s eligibility for listing in the National Register of Historic Places, the negligible, minor, moderate and major degrees do not apply: either a historic property maintains the characteristics making it eligible for listing in the National Register of Historic Places, or it does not. It cannot, for example, be moderately eligible for listing on the National Register.

The ACHP has issued regulations for the implementation of section 106, entitled *Protection of Historic Properties* (36 CFR 800). ACHP regulations discuss the following types of effect:

- *No Historic Properties Affected:* When there are no historic properties present, or the action will have no effect on historic properties, the action is said to have *no effect* on historic properties.
- *No Adverse Effect:* Occurs when there will be an effect on a historic property, but the action will not alter characteristics that make the property eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the property.
- *Adverse Effect:* Occurs when an action will alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places, in a way that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative.

### Resolving Adverse Effects to Historic Properties

An adverse effect under Section 106 of NHPA can be resolved with a good faith effort to consider whether and how to avoid, reduce, or mitigate the effect, which could be done by modifying the undertaking, imposing certain mitigation conditions, such as photo documentation, treatment of

historic buildings, structures, and landscapes in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties (Standards)* or other measures negotiated in consultation with the California State Historic Preservation Officer, American Indian tribal governments, and the public. These measures would be documented in a memorandum of agreement or a NEPA decision document. Yosemite's 1999 Programmatic Agreement also stipulates standard mitigation measures that can be implemented to resolve an adverse effect. These measures are: recordation, salvage, interpretation, and National Register reevaluation.

### **Significant Impact**

For the purposes of the National Environmental Policy Act and DO-12, an impact on a National Register property would be considered significant when an adverse effect cannot be resolved by agreement among the California State Historic Preservation Officer, the ACHP, American Indian tribal governments, other consulting and interested parties and the public. The resolution must be documented in a memorandum or programmatic agreement or the NEPA decision document.

### **Methodology**

In accordance with ACHP regulations implementing Section 106, impacts on historic properties were identified and evaluated by:

- Determining the *area of potential effect*
- Identifying cultural resources present in the *area of potential effect* that were either listed in or eligible for listing in the National Register of Historic Places
- Applying the criteria of adverse effect to affected cultural resources listed in or eligible for listing in the National Register of Historic Places
- Considering ways to avoid, minimize, or mitigate adverse effects

### **Area of Potential Effect for this Project**

As defined under Section 106 of the National Historic Preservation Act, the *area of potential effect* for this project is the entire Badger Pass Ski Area historic site (see Figure 3-2).

### **Properties Analyzed for this Project**

Historic properties that could potentially be affected by this project are the Badger Pass Ski Area historic site, which includes the ski lodge and the associated cultural landscape.

### **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 reasonably foreseeable future actions. Impacts would be considered cumulative regardless of what agency or group (federal or nonfederal) undertakes the action. The CEQ describes a cumulative impact as follows (Regulation 1508.7):

*...a "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The cumulative impacts addressed in this analysis include past actions, present actions, as well as any planning or development activity currently being implemented or planned for implementation in the reasonably foreseeable future. Cumulative actions are evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource. Because some of the cumulative projects are in the early planning stages, the evaluation of cumulative impacts was based on a general description of the project. Appendix A contains a list of projects included in the cumulative impacts analysis. Cumulative impacts are addressed for each alternative in the Environmental Consequences section of each resource topic.

## Impairment

In addition to determining the environmental consequences of the alternatives, NPS *Management Policies 2006* (NPS 2006) and DO-12, require analysis of potential effects to determine if actions would impair park resources.

Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. The need to analyze and disclose impairment impacts originates from the National Park Service Organic Act (NPS 1916). The Organic Act established the National Park Service with a mandate “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.”

An impact would be less likely to constitute impairment if it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park;
- Identified as a goal in the *Yosemite General Management Plan* or other relevant NPS planning documents.

The evaluation of impairment of park resources was based on the type and intensity of impacts and the types of resources affected. Overall, beneficial impacts would not constitute impairment. With respect to the intensity of impacts, negligible and minor adverse impacts are not of sufficient magnitude to constitute impairment. Moderate and major adverse impacts may constitute impairment but do not automatically do so. Rather, these impacts must be analyzed with respect to the three bulleted criteria above. Impairment is generally considered for geologic, hydrologic, biological, cultural, scenic, and recreation resources. Impairment is not analyzed for non-resource topics such as visitor experience and recreation, visitor services, facilities operations and management, transportation, and energy consumption. Impairment is addressed for each alternative in the Environmental Consequences section of each applicable resource topic.

## **Impact Mitigation Measures**

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts, to help ensure that the activities associated with the Badger Pass Ski Lodge Rehabilitation Project would protect park resources and the quality of the visitor experience. Mitigation measures include the following types of actions:

- *Avoid* conducting management activities that would adversely affect the resource.
- *Minimize* the type, duration, or intensity of the impact on an affected resource.
- *Repair* localized damage to the affected resource immediately after an adverse impact.
- *Rehabilitate* an affected resource with a combination of additional management activities.
- *Compensate* a major long-term adverse direct impact through additional strategies designed to improve an affected resource to the degree practicable.

Specific mitigation measures that would occur prior to, during, and after construction under all action alternatives are described in Appendix B, Mitigation Measures Common to All Alternatives.

## **Natural Resources**

### **Soils**

#### **Affected Environment**

The Badger Pass Ski Lodge lies along the northern fringe of Monroe Meadow, near the terminus of the Badger Pass Ski Area ski runs, at an elevation of approximately 7,200 feet. Natural Resources Conservation Service (NRCS) soils data indicate that the Badger Pass Ski Lodge and the immediately adjacent parking loop were constructed on soils characteristic of mountain valleys and moraines with slopes generally between 5% and 30%. The soils in the remaining portion of the parking lot further north of the ski lodge area are more upland in nature and characteristic of soils found along mountain slopes or summits, with slopes between 0% and 25% (NRCS 2006).

In the immediate vicinity of the ski lodge, the land surface slopes gently in a general westerly direction. Surface (less than 12 inches in depth) and sub-surface (greater than 12 inches in depth) soils have been previously disturbed in the area surrounding the ski lodge as a result of construction and expansion of the ski lodge itself, construction and maintenance of the parking lot loops directly adjacent to the north side of the ski lodge, the construction and maintenance of storm and sanitary sewers, water, and electrical lines currently serving the ski lodge.

Based on drill log data for two groundwater wells serving the ski area, surface and sub-surface soils adjacent to ski lodge consist of 2 to 5 feet of peat in the meadow area overlying approximately 100 feet of sand, gravel, and boulders before encountering bedrock. A series of shallow soil borings (maximum depth of 30 feet below ground surface) taken in close proximity to the ski lodge encountered peat, silty sands, sands, gravelly sands, and areas of decomposed granite (ERM 2008).

Another second series of shallow soil samples (maximum depth of 18 inches) were taken in conjunction with a wetlands survey in the immediate area surrounding the ski lodge. Samples taken in the meadow area south and west of the ski lodge were dominated by sandy peats, whereas

soils north of the site in the vicinity of the parking area and the treed island were dominated by fill and/or more sandy material (NewFields 2009).

In addition to the above, in the summer and fall of 2009, seven soil borings between 5 and 51.5 feet in depth and seven dynamic cone penetrometer tests between 5 and 8 feet in depth were taken in the vicinity of the lodge and Nordic rental building to provide soil engineering data to assist with foundation design recommendations for rehabilitation of the lodge. Each of these soil borings was located on portions of the asphalt/concrete surfacing associated with the existing parking lot and drop off area in front (north) of the ski lodge. Data from these borings indicate that soils beneath the pavement and associated aggregate sub-base consisted primarily of poorly graded sandy silts and silty sands, with occasional gravels, cobbles, and organic materials (Kleinfelder 2010).

The 2009 soils investigation results also indicate that the upper 8 feet of soils in the project vicinity could be prone to liquefaction in the event of ground shaking of sufficient intensity. The related geotechnical report (Kleinfelder 2010) estimates that total settlements caused by the seismically induced cyclic stress at the site could cause settlements of about 1.7 inches in the upper 8 feet of soils.

In October 2005, during the excavation of two footings associated with the walkway between the ski lodge and the former ski rental shop located to the west and slightly south (which has since been dismantled and removed), discolored soil and a sheen were observed on the soil and in groundwater within the footing excavation. Proper regulatory notifications were made and additional site investigations were conducted in 2006 and 2007 (ERM 2008). The results of these investigations identified a small shallow contaminant plume consisting of fuel-oil constituents beneath the boiler room area and adjacent to the west end of the ski lodge, with the likely source being an older underground diesel storage tank (since replaced and upgraded) that provided fuel for the boilers at the ski lodge. With the concurrence of the California Regional Water Quality Control Board, methods for remediation of this contaminant plume would be evaluated once the preferred alternative for the rehabilitation of the Badger Pass Ski Lodge has been determined (ERM 2008). Remediation of contaminated soils may occur in conjunction with this rehabilitation project.

## **Environmental Consequences - Methodology**

Soils analysis was based on a qualitative assessment of generalized soil types and typical effects of the type of impact described.

**Type:** Beneficial impacts would protect soils from erosion or restore natural soil conditions; adverse impacts would degrade chemical or physical properties of soils or result in the loss or temporary removal of soils.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

Under Alternative 1 there would be no new impacts on soils. Continued use of the Badger Pass Ski Area during the winter would not impact soils in the immediate vicinity of the ski lodge because of frozen ground and high snow levels, essentially protecting the ground surface. Curbing, improved drainage, and resurfacing of the parking lot and roadway area along the north side of the ski lodge as part of the Glacier Point Road rehabilitation project during the summer of 2009 would be

expected to minimize or eliminate the potential for soil erosion to occur directly adjacent to the ski lodge as a result of runoff during snow melt and episodic rainfall events.

**Conclusion:** Under Alternative 1, there would be no ground disturbing activities and as a result, no impacts on soil resources.

### **Cumulative Impacts**

Localized short-term, adverse impacts on surface and sub-surface soils could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects which contributed to adverse impacts on soils within the project area included the construction, modification, and expansion of the ski lodge and parking areas, construction of the access road, ski runs, lifts and associated infrastructure; routine maintenance activities, demolition of the Alpine rental shop, installation of temporary rental facilities, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts.

As part of the Glacier Point Road rehabilitation project, improvements to the Badger Pass Ski Area parking lot in 2009 included curbing and the re-crowning of the adjacent roadway and parking lot to help direct runoff away from the north side of the lodge. This action would result in overall long-term beneficial impacts on soils by improved drainage in the project area. Other current or reasonably foreseeable projects that could contribute to impacts on soils include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The effects to soils associated with road rehabilitation projects would be localized and short-term in nature, resulting in overall long-term beneficial impacts on soils by improved drainage, remediation of small amounts of soil contamination, and minimizing the potential for soil erosion.

Overall, the cumulative actions in combination with Alternative 1 would result in a net local and regional long-term, negligible, beneficial impact on soils.

### **Impairment**

Alternative 1 would result in no changes to soils in the project area from current conditions. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, and no effect on resource values highlighted in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair soil resources for future generations.

## **Environmental Consequences of Alternatives 2, 3, and 4**

### **Analysis**

**Construction-related impacts:** Construction-related impacts associated with Alternatives 2, 3, and 4 are generally similar and are therefore discussed collectively.

All of the action alternatives would result in the disturbance of minor amounts of surface and near surface soil in the immediate area around the ski lodge and along utility corridors as a result of footing repair/replacement, access on the west, south, and east sides of the building for construction equipment, trenching for new water and sewer lines to the Alpine rental building and Nordic Center, a new water line following the existing utility corridor to the existing water tank for fire protection, and site drainage improvements at the main lodge, Alpine rental building, and

Nordic Center. In addition, replacement of the Nordic rental building in all action alternatives would also disturb small amounts of soil to the west and south of that building. The majority of ground disturbance would take place in previously disturbed areas. The existing building footprint consists of fill materials; the majority construction activities in this area would disturb non-native soils.

Under Alternatives 2, 3, and 4, the short-term disturbance from construction activities would include approximately 0.6 acres of surface and near-surface soils, resulting in local, short-term, minor adverse impacts on soils which could re-occur over two, four, and five summers respectively, as subsequent phases associated with these alternatives are implemented.

**Long-term impacts:** Under Alternative 4, there would be a permanent impact on wetland soils on the southeastern side of the ski lodge from the expansion of the new Alpine rental building outside of the existing building footprint by approximately 224 square feet, resulting in a long-term, minor, adverse effect on soil resources in the project area.

All action alternatives would incorporate the use of drilled piers and grade beams under most new structural elements and the use of compaction grouting under existing foundations to remain. These methods were selected to mitigate the potential hazard posed by liquefaction and minimize construction disturbance to adjacent meadow areas. Information on the size and depth of drilled piers is not currently available, pending additional geotechnical investigation at the site. Based on currently available information, these structural treatments would be expected to have a long-term, minor, adverse impact on soils.

In all action alternatives, soil contamination adjacent to the western site of the ski lodge may be remediated in conjunction with construction activities. The soil contamination consists of localized, low-mobility diesel-range petroleum hydrocarbons near the site of a former fuel-oil storage tank previously located in the area. Regardless of the alternative selected under this rehabilitation plan, this contamination would be remediated under a state-approved corrective action plan with the Regional Water Quality Control Board (RWQCB). Construction activities in this rehabilitation plan would provide an opportunity to directly access residual contamination that may have migrated beneath utility lines or the west building, potentially allowing more complete removal of contaminated soil. This would result in a long-term, minor to moderate, beneficial impact on soil resources.

Operation-related impacts on surface and near-surface soils are not expected to occur once soils are fully restored and stabilized, a condition that may take a few years to reestablish.

**Conclusion:** Approximately 0.6 acres of surface and near-surface soils would potentially be disturbed as part of construction activities under all action alternatives. This would result in localized short-term, minor, adverse impacts on surface and sub-surface soils over two, four, and five summers respectively, as subsequent phases associated with these alternatives are implemented.

In conjunction with construction activities, soil contamination from localized, low-mobility diesel-range petroleum hydrocarbons found in soils near the site of a former fuel storage tank may be remediated. All remediation activities occurring in conjunction with this rehabilitation project would be undertaken with oversight from the RWQCB. This would result in a long-term, minor to moderate, beneficial impact on soil resources.

Structural upgrades under all action alternatives would include measures to mitigate the presence of soils subject to liquefaction found under the lodge complex. These structural treatments would be expected to have a long-term, minor, adverse impact on soils.

Under Alternatives 2 and 3, no additional long-term impacts on soils are anticipated once construction and subsequent restoration activities have been completed. Under Alternative 4, there would be a localized, long-term, minor adverse impact on soils due to the approximately 224 square foot expansion of the new Alpine rental building to the southeast of the existing building footprint.

### **Cumulative Impacts**

Localized short-term, adverse impacts on surface and sub-surface soils could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects which contributed to adverse impacts on soils within the project area included the construction, modification, and expansion of the ski lodge and parking areas, construction of the access road, ski runs, lifts and associated infrastructure; routine maintenance activities, demolition of the Alpine rental shop, installation of temporary rental facilities, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts.

As part of the Glacier Point Road rehabilitation project, improvements to the Badger Pass Ski Area parking lot in 2009 included curbing and the re-crowning of the adjacent roadway and parking lot to help direct runoff away from the north side of the lodge. This action would result in overall long-term beneficial impacts on soils by improved drainage in the project area. Other current or reasonably foreseeable projects that could contribute to impacts on soils include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The effects to soils associated with road rehabilitation would be localized and short-term in nature, resulting in overall long-term beneficial impacts on soils by improved drainage and minimizing the potential for soil erosion.

Although the majority of surface soils disturbed by construction activities would ultimately be restored, some soil structure and integrity would be lost, but more so with Alternative 4 than with Alternatives 2 and 3. The cumulative projects in combination with Alternatives 2, 3, and 4 would result in a regional long-term negligible adverse effect on overall soil resources in Yosemite National Park.

### **Impairment**

Alternatives 2, 3, and 4 would result in localized minor, adverse impacts on soils. However because no resources specific to the park's purpose would be adversely affected, and there would be no change to the natural and cultural integrity of the park, nor an effect on resource values highlighted in the 1980 *Yosemite General Management Plan*, Alternatives 2, 3, and 4 would not impair park soils for future generations.

## **Hydrology and Water Quality**

### **Affected Environment**

The Badger Pass Ski Lodge is located along the northern fringe of Monroe Meadow, a bowl shaped depression at an elevation of approximately 7200 feet, at the base of Badger Pass Ski Area.

There are wetlands along the west, south, and east sides of the ski lodge, and to the east of the temporary Nordic rental building.

**Surface Waters:** Snow melt and rainfall runoff from the ski area drain into Grouse Creek, a small perennial stream. The headwaters for Grouse Creek are located well east of the ski lodge. As it approaches the ski lodge, Grouse Creek appears to be diverted below grade via a culvert system of unknown age, construction, condition, and configuration, and is discharged to the downgradient surface expression of Grouse Creek at a culvert outfall located southwest of the west building. A segment of the culvert suspected to convey this diverted surface is partially exposed along the south side of the ski lodge deck, where it is a crushed corrugated metal pipe. During the early spring and summer, water from snowmelt and runoff ponds to a depth of several inches in portions of Monroe Meadow. In June 2009, ponded water was observed over a large portion of the meadow directly adjacent to the east, south, and west sides of the ski lodge. Saturated soils and surface water ponding also occur in a small, bowl-shaped wetland in the lower parking lot tree island, near the eastern end of the Nordic rental building (NewFields 2009).

**Ground Water:** Ground water levels along the north, south, and west portions of the ski lodge area range from completely saturated in the early spring and summer to approximately 6 feet below the ground surface during the late summer and winter months. On the south side of the building, ground water levels are likely at or near the surface year round. Ground water elevation contours in the vicinity of the ski lodge generally correspond with existing site topography (ERM 1996; ERM 2008). Ground water levels ranged from between 5 and 15 feet below the ground surface in a series of borings taken along the northern side of the ski lodge (which is slightly higher elevation than that of the adjacent meadow) in the summer of 2009 (Kleinfelder 2010).

High ground water levels directly adjacent to and beneath the ski lodge have caused seepage through portions of foundation walls and the basement floor.

As discussed in the soils analysis (above), there is a small shallow area of contaminated soil consisting of localized, low-mobility diesel-range petroleum hydrocarbons near the site of a former fuel-oil storage tank near the west building. Remediation of this contamination may be conducted in conjunction with the implementation of this project, as there would potentially be greater access during construction activities to soil contaminants that may be beneath utilities or the west building. All remediation activities would be undertaken in a manner consistent with RWQCB requirements and guidelines, regardless of the alternative selected for this project. Depending on the time of year and the ground water levels at the time of remediation, there is the potential that small localized amounts of ground water may come in contact with contaminated soil during the remediation process.

**Water Supply/Quality:** Domestic water for the Badger Pass Ski Lodge is provided by two groundwater supply wells, one located on the eastern side of the existing Alpine rental building, and the other located along the south side of the ski lodge. The well on the southern side of the ski lodge is used as a backup well and has not been in use for several years. The water supply system also includes a chlorination system located in the basement of the ski lodge, with an approximate 96,000 gallon storage tank and connecting cast iron piping (Page & Turnbull 2009a). The water storage tank is located approximately 700 feet east of the ski lodge at an elevation of approximately 7300 feet, or about 100 feet higher than the ski lodge.

Production Well #1, located east of the existing Alpine rental building, is screened from 17 to 98 feet below ground surface and sealed to a depth of approximately 11 feet. Production Well #2, located along the south side of the ski lodge, is an open bottom well that pulls water from the interval between 120 to 200 feet below ground surface and is sealed to a depth of 120 feet. Four-inch polyvinyl chloride (PVC) pipe has been installed to the bottom of both wells, and the bottom 20 feet of each pipe is perforated (ERM 2006; ERM 2008). Based on laboratory testing data conducted in 1992, the domestic water supply meets or exceeds drinking water standards.

Water production from Production Well #1 varies over the course of the year as a result of varying seasonal demands, but the well averaged about 155,000 gallons/month in 2008. The highest monthly production occurred in January, February, and March, coinciding with the peak months of the ski season. Overall water consumption (versus production) averaged approximately 54,000 gallons/month. Based on these numbers, approximately 100,000 more gallons of water are produced each month than are consumed. The apparent reason for this discrepancy is that the well pump in Production Well #1 is on a timer and is scheduled to pump water during the evening hours through the chlorination system (located in the basement of the ski lodge) and then to the storage tank. Because the well pump is on a timer, the storage tank becomes full prior to the pump shutting off, overflows, and then releases treated (chlorinated) water to the ground at the base of the tank.

**Wastewater Management:** Wastewater from the ski lodge drains via a sanitary sewer main to two septic tanks located near the maintenance shop. Kitchen wastewater is diverted through grease traps installed adjacent to the north side of the ski lodge main building before being routed to the sewer main. From the septic tanks, wastewater is pumped to a leachfield located west of the maintenance area. The current wastewater treatment system is permitted to discharge 4,500 gallons per day of wastewater. The system was most recently upgraded in 2006, at which time the sewer lines west of the ski lodge and west building were replaced. Sewer lines beneath the ski lodge main and west buildings are thought to be the original lines.

Discrepancies between recorded water consumption and wastewater disposal volumes suggest that groundwater could be infiltrating the sewer lines located beneath the ski lodge indicating that the integrity of the sewer lines beneath the lodge may be compromised, and thus may threaten local groundwater quality.

## **Environmental Consequences – Methodology**

Methodologies used to evaluate hydrology and water quality are defined earlier in this chapter, beginning on page 3-5, under Methods for Analyzing Environmental Consequences, Impacts Analysis – General.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

Under Alternative 1, there would be no new impacts on hydrology or water quality. The ongoing effects of the facility and parking lot development on the local natural hydrologic processes, including the apparent diversion of Grouse Creek, alterations of natural surface runoff to the meadow from the north, and potential localized deflections of the water table, would continue, resulting in a localized, long-term, minor to moderate adverse effect on the hydrology of the meadow system.

The ski lodge, which is a contributing feature of the Badger Pass Ski Area historic site, would continue to be adversely affected by the local hydrology. During spring and summer months, surface waters would continue to pond directly adjacent to the ski lodge. High ground water levels would continue to seep through existing foundation walls and basement floor of the ski lodge, possibly continuing to infiltrate the sewer lines beneath the structure, resulting in a long-term, moderate, adverse effect to the structure. In addition, approximately 100,000 gallons per month of excess chlorinated groundwater production would continue to overflow the storage tank serving the ski area. It is unclear what effect the long-term discharge of this water has on local vegetation, if any, or if this volume of water is contributing to ponding surface water directly adjacent to the ski lodge.

**Conclusion:** Under Alternative 1, there would be no long-term solution implemented to mitigate the adverse effects to the ski lodge from local hydrologic conditions, or the adverse effects of the ski lodge facilities on local hydrologic processes. Alternative 1 would continue to impact local hydrology through the apparent diversion of Grouse Creek, alterations of natural surface runoff to the meadow, and potential localized deflections of the water table, resulting in a localized, long-term, minor to moderate, adverse effect on hydrologic processes.

Local hydrologic conditions that create repeated maintenance and repair requirements in portions of the ski lodge directly affected by high ground water levels and ponding surface waters directly adjacent to the facility would continue to occur. In addition, the potential for groundwater to infiltrate old sewer lines beneath the lodge would not be remedied. These represent localized long-term, moderate, adverse effects to the facility caused by local hydrologic conditions.

### **Cumulative Impacts**

The surface water and groundwater hydrologic systems were compromised when the ski lodge and parking lots were constructed, modified, and expanded. Diversion of Grouse Creek underground, which presumably occurred when the lodge was constructed, continues to adversely affect the local hydrologic regime.

As part of the Glacier Point Road rehabilitation project, improvements to the Badger Pass Ski Area parking lot in 2009 included curbing and the re-crowning of the adjacent roadway and parking lot to help direct runoff away from the north side of the lodge, these actions would be expected to provide a negligible to minor long-term beneficial impact on local hydrologic conditions by redirecting runoff from the ski lodge area and toward Grouse Creek. There would also be a long-term, minor, beneficial impact on water quality in Grouse Creek related to the installation of filters in the new drain inlets in the parking lot, which are intended to control sediment and parking lot contaminant loading to the creek and surrounding areas.

Groundwater quality would benefit from remediation of the residual fuel-oil contamination at the west end of the lodge as part of a state-approved corrective action plan. However, the continued interception and redirection of runoff from hard surfaces at the Badger Pass ski area would continue to have a long-term adverse effect on wetland hydrology in the meadow.

Overall, the cumulative actions in combination with Alternative 1 would result in a net localized long-term, negligible to minor, adverse impact on hydrology.

### **Impairment**

Alternative 1 (No Action) would result in no changes to hydrology and water quality in the project area from current conditions. Because no resources specific to the park's purpose would be affected, and there would neither be change to the natural and cultural integrity of the park, nor effects to resource values highlighted in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair these resources for future generations.

## **Environmental Consequences of Alternatives 2, 3, and 4**

### **Analysis**

**Construction-related impacts:** As it relates to hydrology and water quality, construction-related impacts associated with Alternatives 2, 3, and 4 are generally similar, and therefore are discussed collectively. The primary difference between Alternatives 2, 3, and 4, is that construction vehicle access along the east, south and west sides of the ski lodge and at the Nordic Center could re-occur over two, four, and five summer seasons respectively, as subsequent phases associated with each of these alternatives are implemented.

Implementation of Alternatives 2, 3, and 4 would be expected to encounter high ground water levels, and possibly ponding water, along the east, south and west sides of the ski lodge and to the east of the Nordic Center. Therefore, excavations necessary for footing and foundation repairs would be expected to require dewatering activities. Dewatering discharges could present localized short-term, moderate, adverse impacts on adjacent wetlands and/or the waters of Grouse Creek as a result of increased sediment loading. In addition, shallow groundwater could contain minor amounts of contamination in the area of a prior diesel fuel release. To reduce these potential impacts to negligible to minor levels, the following should occur:

- To the extent practical, remediate the remaining area of potential shallow groundwater contamination along the west end of the ski lodge in conjunction with the rehabilitation project, compliant with RWQCB requirements;
- Implement Best Management Practices (see Appendix B, Mitigation Measures) to ensure discharges associated with dewatering activities are accomplished in a manner acceptable to the park's Resources Management and Science Division and that no increased sediment loading occurs in Grouse Creek, or otherwise adversely impacts adjacent wetlands.

In addition to the above, and to the extent practical, construction vehicle activity along the east, south and west sides of the ski lodge and to the east of the Nordic Center should be restricted when ponding water is present directly adjacent to the facilities or within their construction buffers.

**Long-term impacts:** Proposed site drainage improvements along the east, south, and west side of the ski lodge and along the east and north side of the new Nordic Center would be designed to redirect surface drainage away from the building towards the meadow and Grouse Creek (see Figure 2-7 for site drainage improvements common to all action alternatives). This would have the dual benefit of reducing or eliminating potential water damage to structures and sustaining groundwater levels in adjacent wetlands. In order to maximize these benefits, the following measures should be considered in the final design of site drainage improvements:

- Proposed new outfalls to Monroe Meadow and Grouse Creek should be completed at the elevation of the meadow surface to avoid downcutting. A rocked-in swale that would allow wetland plants and moss to grow in and around the structure is recommended.

- Regrading of slopes away from the ski lodge and associated buildings should be as close to the foundation as possible, and any associated drainage channel constructed should likewise be as shallow as possible, while achieving the goal of diverting/draining water away from the building foundation. The goal of these measures would be to have a broad drainage swale that is heavily vegetated with wetland plants that would mimic sheetflow rather than channelized flow.
- Final design and installation of the site drainage improvements would be closely coordinated with the park's Resources Management and Science Division.

It is unclear what effects, if any, current water production volumes at the ski lodge (including overtopping the water storage tank by approximately 100,000 gallons of chlorinated groundwater per month) has had on local groundwater resources, or its potential effect on the adjacent wetland meadow area. Measures to eliminate tank overtopping by replacing the timer on the well pump with a float shut-off system on the storage tank would ensure that overtopping is eliminated or reduced from current levels, and would be expected to represent a long-term, negligible to minor, beneficial impact on local groundwater resources.

**Conclusion:** Under Alternatives 2, 3 and 4, the ski lodge would continue to adversely impact local hydrology through the diversion of Grouse Creek, potential deflection of the water table, and some restriction of surface flow. However, proposed site drainage improvements would be expected to have a localized, minor to moderate, beneficial effect on local hydrology by redirecting surface flow away from structures and toward adjacent wetlands and Grouse Creek. Final design of site drainage improvements should be conducted in coordination with the park's Resources Management and Science Division.

The site drainage improvements would also substantially reduce or eliminate potential water damage to structures by redirecting water away from foundations, resulting in a long-term, moderate, beneficial effect on the ski lodge facility. Replacement of the well pump timer would ensure that overtopping on the existing storage tank is eliminated or reduced from current levels, resulting in a long-term, negligible to minor, beneficial impact on local groundwater resources.

During construction activities, mitigation measures (see Appendix B) should be implemented to ensure that dewatering activities do not increase sediment loading in Grouse Creek, or otherwise adversely impact adjacent meadow wetlands. If properly implemented, construction-related impacts would be localized short-term, adverse, and negligible to minor on local hydrology and water quality.

### **Cumulative Impacts**

The surface water and groundwater hydrologic systems were compromised when the ski lodge and parking lots were constructed, modified, and expanded. Diversion of Grouse Creek underground, which presumably occurred when the lodge was constructed, continues to adversely affect the local hydrologic regime.

As part of the Glacier Point Road rehabilitation project, improvements to the Badger Pass Ski Area parking lot in 2009 included curbing and the re-crowning of the adjacent roadway and parking lot to help direct runoff away from the north side of the lodge, these actions would be expected to provide a negligible to minor long-term beneficial impact on local hydrologic conditions by redirecting runoff from the ski lodge area and toward Grouse Creek. There would also be a long-term, minor, beneficial impact on water quality in Grouse Creek related to the installation of filters

in the new drain inlets in the parking lot, which are intended to control sediment and parking lot contaminant loading to the creek and surrounding areas.

Groundwater quality would benefit from remediation of the residual fuel-oil contamination at the west end of the lodge as part of a state-approved corrective action plan. However, the continued interception and redirection of runoff from hard surfaces at the Badger Pass ski area would continue to have a long-term adverse effect on wetland hydrology in the meadow.

Although hydrology and water quality could experience short-term localized negligible to minor adverse construction related impacts, the cumulative projects in combination with Alternatives 2, 3, and 4 would result in a regional long-term negligible adverse effect on overall hydrology and water quality.

### **Impairment**

Alternatives 2, 3, and 4 would result in localized short-term, negligible to minor, adverse impacts to hydrology and water quality during construction. However, because no resources specific to the park's purpose would be adversely affected, and there would be neither change to the natural and cultural integrity of the park, nor effects to resource values highlighted in the 1980 *Yosemite General Management Plan*, Alternatives 2, 3, and 4 would not impair park hydrology or water quality for future generations.

## **Wetlands**

### **Affected Environment**

Wetlands data presented in this section are descriptive, including actual extent (location on the ground and acreage) for the area surrounding the Badger Pass Ski Lodge. Field work emphasized the areas surrounding the existing lodge at Badger Pass Ski Area and was specifically concentrated in the vegetated island in the paved area immediately north of the ski lodge, in Monroe Meadow south of the ski lodge, and in the Grouse Creek outfall west of the ski lodge and parking area (Figure 3-1). The intent is to provide general descriptions, functions, and values of wetland and water-dependent communities surrounding the ski lodge at Badger Pass Ski Area.

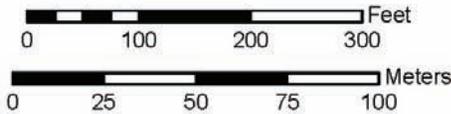
### **Wetland Classification and Definition**

Wetlands are ecologically productive habitats that support a rich array of both plant and animal life. They sustain a great variety of hydrologic and ecological functions vital to ecosystem integrity. These functions include flood abatement, sediment retention, groundwater recharge, nutrient capture, and a supporting environment for high levels of plant and animal diversity. Wetlands and riparian areas are relatively rare compared to the entire landscape and are highly sensitive to human impacts. When wetlands are converted to systems that are intolerant of flooding (e.g., drained agricultural lands, filled developed lands), their storage capacity decreases and downstream flooding increases (National Academy of Sciences 1995). Modification of even small wetlands areas induces effects that are proportionally greater than elsewhere in an ecosystem (Grabner 1996).



**Badger Pass Ski Area Rehabilitation Project  
Wetland and Riverine Habitat Delineation  
Total Survey Area: 7.43 acres**

-  Delineation Area
-  Riverine (0.01 Acres)
-  Palustrine Emergent Wetland (4.36 Acres)
-  Palustrine Scrub - Shrub Wetland (0.40 Acres)



-  Riverine Waypoints
-  Positive Wetland Waypoints
-  Negative Wetland Waypoints

Imagery: National Agricultural Imagery Program, 2005

Figure 3-1 Potential Jurisdictional Waters and Wetlands in the Project Area.

Although there are several definitions for the term ‘wetland’, the two used herein follow NPS and U.S. Army Corps of Engineers (USACE) conventions. The National Park Service classifies and maps wetlands using a system created by the U.S. Fish and Wildlife Service (USFWS), which is often referred to as the Cowardin classification system (Cowardin et al. 1979). *The Classification of Wetlands and Deepwater Habitats of the United States* was formally adopted by the U.S. Department of the Interior and the Federal Geographic Data Committee in 1996 as the standard for classifying and inventorying wetlands and deepwater habitat (NPS 2002). This system classifies wetlands based on vegetative life form, flooding regime, and substrate material. Wetlands, as defined by the U.S. Fish and Wildlife Service, are transitional lands between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is covered by shallow water (Cowardin et al. 1979). For purposes of this classification, wetlands must have one or more of the following attributes:

- The land supports predominantly hydrophytes, at least periodically. Hydrophytes are plants that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
- The substrate is predominantly undrained hydric soils. Hydric soils are wet long enough to periodically produce anaerobic conditions.
- The substrate is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979).

Section 404 of the Clean Water Act assigns jurisdiction over “waters of the United States” to the Environmental Protection Agency (EPA), which bestowed regulatory management to the USACE. The USACE created the *USACE Wetlands Delineation Manual* (Environmental Laboratory 1987) as guidance to delineate and determine federal jurisdiction of waters of the United States, including wetlands. Waters of the United States include features such as streams, rivers, bays, inlets, mudflats, washes, sloughs, sand flats, territorial seas, tributaries, and impoundments. Wetlands are a subset of these waters and therefore receive jurisdictional protection under Section 404 of the Clean Water Act. Wetlands are defined under the Clean Water Act as “those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]).”

The Cowardin system and the USACE both use the three wetlands parameters listed above to define wetlands. However, the Cowardin system defines more habitat types as wetlands than does the USACE definition.

The USACE 404 permit program regulates only the dredging or placement of fill material in jurisdictional waters of the United States. Executive Orders governing the National Park Service cover a much broader range of actions that can have adverse impacts on wetlands such as water diversions or ground water withdrawals. NPS *Director’s Order 77-1: Wetland Protection* states that NPS units are required to: (1) minimize the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.

### Wetlands within the Project Area

The information presented in this section is a compilation of data generated through: (1) a wetland delineation completed for the area surrounding the Badger Pass Ski Lodge by NewFields Environmental Planning and Compliance, LLC in 2009 (NewFields 2009); (2) a wetland assessment completed for the area surrounding the Badger Pass Ski Lodge by LSA Associates in 2008 (LSA Associates 2008); (3) the National Wetlands Inventory (NWI) (USFWS 1996); and (4) Yosemite National Park vegetation mapping efforts (NPS 1997b).

Wetlands and deepwater habitats are broadly classified according to their system, subsystem, class and subclass. All wetlands within the area surveyed for this project fall into two system types: *palustrine* (shallow ponds, marshes, swamps, and sloughs) and *riverine* (wetlands and deepwater habitats contained within a channel).

The Cowardin system defines riverine systems as all wetlands and deepwater habitats contained within the channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5% (Cowardin et al. 1979).

The Cowardin system defines the palustrine system to include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5% (Cowardin et al. 1979).

Subsystems describe characteristics of seasonal water flow. Using the Cowardin classification system, specific wetlands and deepwater classes within the area surveyed for this project consist of the following subclasses:

- *Palustrine emergent* – emergent wetland (marsh, meadow) habitat
- *Palustrine scrub-shrub* – riparian scrub (e.g., willow) habitat
- *Riverine system* – lower perennial (e.g., perennially low flowing streams) habitat

The wetland areas in the vicinity of the Badger Pass Ski Lodge are discussed in more detail below and are organized by wetland types. The wetland delineation and the sample point locations taken during a 2009 survey are shown in Figure 3-1. More detailed information regarding the delineation of wetlands for this project can be found in the *Badger Pass Ski Lodge Rehabilitation Project Delineation of Jurisdictional Waters, Including Wetlands* report (NewFields 2009).

**Palustrine Emergent Wetlands:** As defined by the Cowardin system, the emergent wetland class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed (Cowardin et al. 1979).

Within the survey area for this project, the palustrine emergent wetland is approximately 4.36 acres in size (Figure 3-1). The palustrine emergent wetlands within Monroe Meadow (4.30 acres) are bound to the north by palustrine scrub-shrub wetlands and the ski lodge and pavement. To the south, east, and west, the palustrine emergent wetland extends beyond the survey area.

As noted in the Soils section above, drill log data for two groundwater wells serving the ski area indicate that surface and sub-surface soils adjacent to ski lodge consist of 2 to 5 feet of peat in the meadow area (ERM 2008). This data, plus surface observations during wetlands delineation indicate that the palustrine emergent wetlands within the project area possess many characteristics of a fen (Corps 2009). Further investigation into the classification of this area as a fen is warranted.

A small portion of palustrine emergent wetlands (0.02 acre) are found in the parking island area. This pocket of wetlands is concave and possesses enough water to support wetland vegetation and soils. This wetland is bound by pavement to the south and by mixed conifer forest in all other directions.

The Grouse Creek outfall wetlands contain a mixture of palustrine emergent wetlands (0.04 acre) and palustrine scrub-shrub wetlands (0.03 acre). These wetlands are bounded to the south, east, and west by conifer forest where the elevation of the steep banks deepens the water table. The wetlands extend to the north and continue beyond the survey area.

**Palustrine Scrub-Shrub Wetlands:** As defined by the Cowardin system, the class palustrine scrub-shrub wetland includes areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included (Cowardin et al. 1979).

Within the survey area, the palustrine scrub-shrub wetlands are approximately 0.40 acre in size. These wetlands are found in Monroe Meadow (0.37 acre) and in the Grouse Creek outfall area (0.03 acre).

**Riverine System:** The Cowardin system defines riverine systems as all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5% (Cowardin et al. 1979).

Within the survey area, Grouse Creek was delineated as a riverine system using Cowardin classifications. Grouse Creek was also delineated as a jurisdictional water. The headwaters for Grouse Creek are located well east of the ski lodge. As it approaches the ski lodge, Grouse Creek appears to be diverted below grade (Figure 3-1, point 19) via a culvert system of unknown age, construction, condition, and configuration, and is discharged to the downgradient surface expression of Grouse Creek at a culvert outfall located southwest of the west building (Figure 3-1, point 21). Within the survey area, Grouse Creek was found to be 212.9 feet long with an average width of 2.26 feet, and possesses 0.01 acre.

### **Wetland Vegetation**

Nomenclature for plants used in this report follows *The Jepson Manual: Higher Plants of California* (Hickman 1993). Vegetation types are classified according to Sawyer and Keeler-Wolf (1995). Wetland vegetation within the project area consists of willow thicket dominated by willow trees, forb wetland dominated by herbaceous species, and graminoid wetland dominated by grasses, sedges, and rushes.

**Willow Thicket:** This vegetation type corresponds to the Montane Wetland Shrub Habitat in Sawyer and Keeler-Wolf (1995). Willow thicket occurs in the lower part of Monroe Meadow. A stand of Lemmon's willow (*Salix lemmonii*), approximately 9 feet tall, grows adjacent to the lodge

complex and parking lot. Other stands of Lemmon's willow grow around the periphery of Monroe Meadow. Small stands of Sierra willow (*Salix orestera*), approximately 10 to 20 feet on a side, grow in the middle of Monroe Meadow. These stands of Lemmon's and Sierra willow grow very densely and form impenetrable thickets.

**Graminoid Wetland:** A graminoid is a grass, rush, or sedge. This vegetation type corresponds to the Montane Meadow Habitat in Sawyer and Keeler-Wolf (1995). The graminoid wetland portion of Monroe Meadow is dominated by a variety of sedges and grasses. These species occur mostly in the bottom of the meadow. Species of grass that grow with the sedges (*Carex sp.*) include blue-joint reed grass (*Calamagrostis canadensis*), Kentucky blue-grass (*Poa pratensis*), and ticklegrass (*Agrostis scabra*). Cow-bane (*Oxypolis occidentalis*), an herbaceous species, was observed occasionally among the grasses and sedges in this wetland. This vegetation type averages 3 feet tall and is very dense, with an average cover of 100 percent. Blue-joint reed grass is the most abundant grass and is found in large stands 10 to 20 feet in diameter among the sedges, while other grasses are found in small stands of a few individuals.

**Forb Wetland:** A forb is an herbaceous flowering plant that is not a graminoid. This vegetation type corresponds to the Montane Meadow Habitat in Sawyer and Keeler-Wolf (1995). In the delineation area, the graminoid wetland species dominates the bottom of Monroe Meadow while the forb species are found at the edge of the graminoid wetland and continue up the surrounding slopes.

A variety of forb wetland species grow together at Monroe Meadow. These species include bog lupine (*Lupinus polyphyllus*), scarlet Indian paintbrush (*Castilleja miniata*), arrow-leaved groundsel (*Senecio triangularis*), Bigelow's sneezeweed (*Helenium bigelovii*), California corn lily (*Veratrum californicum*), angelica (*Angelica breweri*), Sierra lily (*Lilium parvum*), hedge nettle (*Stachys ajugoides var. rigida*) and Meadow goldenrod (*Solidago canadensis ssp. elongata*). Forb wetland areas that are relatively wet support primrose monkeyflower (*Mimulus primuloides*), little elephant's heads (*Pedicularis attollens*), rein orchid (*Platanthera dilatata var. leucostachys*), and lady's tresses (*Spiranthes sp.*) Often a sphagnum type of moss grows in these areas as well. These are mainly areas on north-facing slopes where snow probably persists late into the season.

## Environmental Consequences – Methodology

Wetland resources were analyzed using qualitative and, where possible, quantitative assessment of impacts on wetland resources likely caused by the maintenance, construction or rehabilitation of each proposed alternative. The results of the June 2009 wetlands delineation (NewFields 2009) conducted at the Badger Pass Ski Lodge area were used to inform the following analysis.

**Duration:** Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts evaluated below may be classified as short-term or long-term. Short-term impacts are those that are reversible within one to five years and are associated with a specific event. Long-term impacts are reversible over a longer period of greater than five years and impacts may take place continuously based on reoccurring activity.

**Intensity:** Impact intensity definitions are the same as those defined earlier in this chapter, beginning on page 3-5, under Methods for Analyzing Environmental Consequences, Impacts Analysis - General.

**Type:** Beneficial impacts would enlarge the size or enhance the integrity and connectivity of wetlands. Adverse impacts would degrade the size, integrity, or connectivity of wetlands. Direct impacts would be caused by, and occurring at the same time and place as the action. Indirect impacts would be caused by the action, but occurring later in time at some distance or to another resource.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

Under the No Action Alternative, rehabilitation activities would not occur, thus there would be no further degradation to the size, integrity, or connectivity of wetlands adjacent to the facility due to construction-related activities. There would be no new impacts on wetlands under Alternative 1.

**Conclusion:** Alternative 1 would not further degrade the size, integrity, or connectivity of wetlands. There would be no new impacts on wetlands under Alternative 1.

### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wetlands within the project area include the construction, modification, and expansion of the ski lodge and parking areas, construction of the access road, ski runs, lifts and associated infrastructure; the diversion of Grouse Creek in the vicinity of the ski lodge, past and present routine maintenance activities, demolition of the Alpine rental shop, installation of temporary rental facilities, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. The interception and redirection of surface runoff from the ski lodge and parking areas would continue to have a long-term adverse effect on wetlands, although this situation has been recently improved by the Glacier Point Road Rehabilitation Project drainage improvements at the Badger Pass Ski Area parking lot.

Wetlands on the west side of the ski lodge would benefit from remediation of the residual fuel-oil contamination as part of a state-approved corrective action plan. In addition, actions potentially undertaken under the *High-Elevation Aquatic Ecosystem Recovery and Stewardship Plan* would result in the protection and enhancement of wetlands within the project area. In combination with Alternative 1, there would be an overall localized, long-term, minor, adverse impact on wetlands.

### **Impairment**

Alternative 1 (No Action) would result in no change from current conditions. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, nor effects to resource values identified in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair wetlands.

## **Environmental Consequences of Alternatives 2 and 3**

### **Analysis**

The variation between Alternatives 2 and 3 would be relatively minor with regard to potential impacts on wetlands within the project area and thus they are analyzed jointly. Where design differences are relevant to potential impacts on wetlands, they are discussed in further detail.

Under all action alternatives, potential impacts on wetlands would occur from construction activities during rehabilitation of the ski lodge and the west building, drainage and foundation improvements, infrastructure upgrades, and demolition and replacement of the Nordic and Alpine rental buildings. It is anticipated that each construction phase described under Alternatives 2 and 3

would be executed over the course of one summer season. At the most expeditious pace, Alternative 2 would be completed in two years and Alternative 3 would be completed in four years.

Short-term impacts on wetlands may occur from construction related activities in the construction zone surrounding the buildings, utility corridors, and site drainage improvements (see Figure 2-7). The construction zone is consistent in size and location under all action alternatives. The construction zone extends into approximately 0.38 acre of palustrine emergent wetlands to the east, south, and west of the ski lodge to accommodate building reconstruction/rehabilitation, utility upgrades, and site drainage improvements. The construction buffer for utility upgrades and site drainage improvements on the east side of the Alpine rental building includes approximately 0.07 acre of palustrine scrub shrub wetland (willow thicket). Adherence to mitigation measures in Appendix B and avoidance of wetlands where possible would minimize these impacts to localized, short-term, minor, and adverse.

The replacement of the temporary Nordic rental building with a permanent structure would require a construction zone that may enter a small isolated palustrine emergent wetland approximately 950 square feet (0.02 acre) in size located to the east of the existing building. Construction activity in this area may result in localized, short-term, minor, adverse impacts. Adherence to mitigation measures in Appendix B and avoidance of wetlands where possible would minimize these impacts.

Dewatering activities and water runoff from impermeable surfaces could cause sediment-laden and/or contaminated water to enter Grouse Creek along the west end of the ski lodge complex during construction and would potentially result in adverse impacts on wetlands. The impacts of dewatering are discussed under the Hydrology section of this chapter, above. The potential effects of dewatering and surface water runoff would be greater in Alternative 3 than under Alternative 2, due to the greater number of construction seasons required to complete the project. Implementation of standard mitigation measures in Appendix B and those recommended in the Hydrology section of this chapter, as well as following avoidance procedures, would reduce impacts to localized, short-term, negligible to minor, and adverse.

Alternative 2 would replace the Alpine rental building in the same footprint as the current building, while the permanent Alpine rental building under Alternatives 3 would be the same overall size as the existing structure, but would extend to the north into the existing parking lot. It is not anticipated that either alternative would have long-term adverse impacts on wetlands in the project area.

In the long-term, site drainage improvements proposed for all action alternatives would have the minor to moderate, beneficial effect of redirecting water away from buildings and toward meadows and Grouse Creek. Adherence to the measures proposed in the Hydrology section of this chapter, including revegetation with native wetland plants, constructing outfall structures at the level of the meadow, and design of drainage features to mimic sheetflow would maximize these potential benefits.

**Conclusion:** Construction activities would have the potential to affect approximately 0.38 acre of palustrine emergent wetlands to the east, south, and west of the ski lodge and approximately 0.07 acre of palustrine scrub shrub wetland to the east of the ski lodge. Construction activities at the Nordic Center would also have the potential to affect a small palustrine emergent wetland on the vegetation island north of the lodge. Adherence to proposed mitigation measures and avoidance of

wetlands where possible would reduce potential construction related effects of Alternatives 2 and 3 on wetlands to localized, short-term, minor, adverse impacts. There would be greater potential for construction-related effects under Alternative 3 due to the longer construction timeframe.

Implementation of Alternatives 2 and 3 would not further disrupt the long-term continuity or integrity of native plant communities. Under all action alternatives, proposed site drainage improvements would have the long-term, minor, beneficial effect of redirecting water away from buildings and toward wetland areas and Grouse Creek.

### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wetlands within the project area include the construction, modification, and expansion of the ski lodge and parking areas, construction of the access road, ski runs, lifts and associated infrastructure; the diversion of Grouse Creek in the vicinity of the ski lodge, past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental facilities, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. The interception and redirection of runoff from the ski lodge and parking areas would continue to have a long-term adverse effect on wetlands, although this situation has been recently improved by the Glacier Point Road rehabilitation project improvements to the Badger Pass Ski Area parking lot.

Wetlands on the west side of the ski lodge would benefit from remediation of the residual fuel-oil contamination as part of a state-approved corrective action plan. In addition, actions potentially undertaken under the *High-Elevation Aquatic Ecosystem Recovery and Stewardship Plan* would result in the protection and enhancement of wetlands within the project area. In combination with construction-related activities and long-term site drainage improvements under Alternatives 2 and 3, there would be an overall localized, long-term, negligible, adverse cumulative impact on wetlands.

### **Impairment**

Alternatives 2 and 3 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 2 and 3 would not impair park wetlands.

## **Environmental Consequences of Alternative 4**

### **Analysis**

The impact of Alternative 4 would be the same as under Alternatives 2 and 3, with the following exceptions: At the most expeditious pace, implementation of Alternative 4 would be expected to occur over five summer seasons. In addition, the permanent footprint of the proposed new Alpine rental building would extend beyond the existing building footprint into palustrine emergent wetlands southeast of the existing facility. The additional area of wetland vegetation taken by the expanded footprint is estimated at 224 square feet. The result would be a localized, long-term, minor to moderate, adverse effect on wetlands in the project area.

**Conclusion:** The potential short-term, adverse effects of construction activities in Alternative 4 would be the same as under Alternatives 2 and 3, although there would be greater potential for construction-related effects under Alternative 4, due to the longer construction timeframe. As

under all action alternatives, proposed site drainage improvements would have the long-term, minor, beneficial effect of redirecting water away from buildings and toward wetland areas and Grouse Creek.

Under Alternative 4, the permanent Alpine rental building would be slightly larger than under Alternatives 2 and 3, and would extend approximately 224 square feet beyond the existing facility footprint into palustrine emergent wetlands on the southeast side of the lodge, resulting in a long-term, minor to moderate, adverse impact on wetlands in the project area.

### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wetlands within the project area include the construction, modification, and expansion of the ski lodge and parking areas, construction of the access road, ski runs, lifts and associated infrastructure; the diversion of Grouse Creek in the vicinity of the ski lodge, past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental facilities, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. The interception and redirection of runoff from the ski lodge and parking areas would continue to have a long-term adverse effect on wetlands, although this situation has been recently improved by the Glacier Point Road rehabilitation project improvements to the Badger Pass Ski Area parking lot.

Wetlands on the west side of the ski lodge would benefit from remediation of the residual fuel-oil contamination as part of a state-approved corrective action plan. In addition, actions potentially undertaken under the *High-Elevation Aquatic Ecosystem Recovery and Stewardship Plan* would result in the protection and enhancement of wetlands within the project area. In combination with construction-related activities, long-term site drainage improvements, and expanded facility footprint under Alternative 4, there would be an overall localized, long-term, minor adverse cumulative impact on wetlands.

### **Impairment**

Alternative 4 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternative 4 would not impair park wetlands.

## **Vegetation**

### **Affected Environment**

The description of the vegetation types in the vicinity of the Badger Pass Ski Lodge are organized by wetland and upland types, in accordance with Sawyer and Keeler-Wolf (1995). Wetland vegetation types are discussed above, in the Wetlands section of this chapter. Upland vegetation types are discussed below.

### **Upland Vegetation**

The upland vegetation types found in the vicinity of the Badger Pass Ski Lodge consist of red fir forest, an upland herbaceous plant community dominated by a variety of plant species, and an association dominated by grasses.

**Red Fir Forest:** This vegetation type corresponds to the Red Fir Series in Sawyer and Keeler-Wolf (1995). The red fir forest is dominated by red fir (*Abies magnifica*) and an occasional lodgepole pine (*Pinus contorta*). Red fir forest is found in the vegetation islands in the ski area parking lot, along the parking and maintenance roadways, and on the periphery of ski slopes. The majority of the trees in the project area average one foot in diameter or smaller, however, a number of trees approach two feet in diameter and a few trees are three feet in diameter.

The understory of the red fir forest consists of Sierra gooseberry (*Ribes roezlii*), wax currant (*Ribes cereum*), Sierra Nevada currant (*Ribes nevadense*), twinberry (*Lonicera involucrata*), bracken fern (*Pteridium aquilinum*), and bush chinquapin (*Chrysolepis sempervirens*). Bitter cherry (*Prunus emarginata*) grows at the edge of the red fir stands on open areas. Herbaceous species, such as large-flowered collomia (*Collomia grandiflora*) and meadow goldenrod are also found in openings of the red fir forest.

**Upland Forb Field:** This vegetation type corresponds to the Montane Meadow Habitat described by Sawyer and Keeler-Wolf (1995) found in the Badger Pass Ski Area. Both the forb wetland and the upland forb field have similar plant species compositions, with the main difference being the conditions of wetland hydrology and hydric soils for the former vegetation type. The herbaceous vegetation association intergrades with the forb wetland and contains many of the same species, some of which are facultative wetland plants. Upland forb fields are found on the higher slopes above the ski lodge. This vegetation type is dominated by meadow goldenrod, which are found in large patches. Growing with or beside the patches of meadow goldenrod are yarrow (*Achillea millefolium*), sheep sorrel (*Rumex acetosella*), cow parsnip (*Heracleum lanatum*), Brewer's aster (*Aster brewerii*), blue wildrye (*Elymus glaucus*), squirrel-tail grass (*Elymus elymoides*), and monument plant (*Swertia radiata*). The cover of the meadow goldenrod approaches 100 percent while the other species compose less cover (LSA Associates 2008).

**Upland Grassland:** This vegetation type corresponds to the Montane Meadow Habitat described by Sawyer and Keeler-Wolf (1995) found in the Badger Pass Ski Area. This vegetation type is dominated by grasses such as blue wildrye and squirrel-tail grass and is found on the slopes above the ski lodge in shallower, upland soils. This vegetation type intergrades with the upland forb field, but is distinguished by the dominance of grass species as opposed to forbs.

## Environmental Consequences – Methodology

Vegetation analysis was based on a qualitative assessment of project area vegetation and the effects anticipated as a result of ongoing maintenance, construction, or rehabilitation.

Natural processes such as flooding sustain many plant communities. This impact analysis considered whether changes would occur that affect opportunities for natural processes to take place. For example, in areas where proposed work may affect the hydrology of a system, impacts were analyzed to assess changes to the distribution, composition, and diversity of associated plant communities.

Non-native species can alter soil chemical and physical properties, hamper native species establishment, and ultimately alter native plant community structure and function. This impact analysis considered whether proposed actions would favor the establishment of non-native species, as well as the ability to contain and reverse non-native plant infestation.

**Context:** The area of potential effect would be detectable only within the vicinity of the proposed action. Thus, the setting or area within which impacts are analyzed would be local.

**Duration:** Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts evaluated below may be classified as short-term or long-term. Short-term impacts are those that are reversible within one to five years and are associated with a specific event. Long-term impacts are reversible over a longer period of greater than five years and impacts may take place continuously based on reoccurring activity.

**Intensity:** Impact intensity definitions are the same as those defined earlier in this chapter, beginning on page 3-5, under Methods for Analyzing Environmental Consequences, Impacts Analysis - General.

**Type:** Actions that reduce the size or disrupt the continuity, and/or integrity of native plant communities are considered adverse impacts. Ground disturbance and importation of contaminated materials can adversely impact native plant communities because they provide means for non-native species to gain a foothold in the park. Standard mitigation measures, such as inspecting construction vehicles for invasive species, minimize such adverse impacts. Restoration of disturbed areas using native seeds, plants, mulch, or other stabilizing materials accelerates site recovery and reduces opportunities for exotic plants to become established. Actions that preserve and/or restore any or all of these essential qualities of native plant communities constitute beneficial impacts.

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

There would be no new disturbance to vegetation under Alternative 1. Disturbance to vegetation within the proposed project area would be limited to previously disturbed locations. Previous disturbance includes the incremental and minor loss to vegetation in the Badger Pass Ski Area from construction activities.

**Conclusion:** Alternative 1 would not further reduce the size or disrupt the continuity, and/or integrity of native plant communities. There would be no new impacts on vegetation under Alternative 1.

### Cumulative Impacts

Past projects which contributed to adverse impacts on vegetation within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental buildings, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a localized, short-term, direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have localized, beneficial, direct and indirect,

long-term, minor impacts on vegetation. Overall, Alternative 1 would have a localized, long-term, minor, adverse impact on vegetation.

### **Impairment**

Alternative 1 (No Action) would result in no change from current conditions. Because no resources specific to the park's purpose would be affected, and there would neither a change to the natural and cultural integrity of the park, nor a change to resource values identified in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair park vegetation resources within the project vicinity.

## **Environmental Consequences of Alternatives 2 and 3**

### **Analysis**

The variation between Alternatives 2 and 3 is relatively minor with regard to potential impacts on vegetation within the project vicinity and thus they are analyzed jointly. Where design differences are relevant to the potential impacts of vegetation, they are discussed in further detail.

Under all action alternatives, potential impacts on vegetation may occur from construction activities during rehabilitation of the ski lodge and the west building, site drainage and foundation improvements, infrastructure upgrades, and demolition and replacement of the Nordic and Alpine rental buildings. It is anticipated that each construction phase described under Alternatives 2 and 3 would be executed over the course of one summer season. At the most expeditious pace, Alternative 2 would be completed in two years and Alternative 3 would be completed in four years.

Short-term impacts on vegetation during construction activity would include crushing of vegetation and soil compaction on the east, south, and west sides of the ski lodge and in the vicinity of the existing temporary Nordic rental building. The short-term, construction related impact on wetland vegetation in these areas is discussed under 'Wetlands' above. A red fir stand may be impacted by the construction of a new Nordic Center on the vegetation island north of the ski lodge. Adherence to mitigation measures in Appendix B, including consultation with the park vegetation ecologist and forester, would minimize potential impacts on trees and understory vegetation, as well as potential root damage at this location.

The potential effects of construction activities would be greater in Alternative 3 than under Alternative 2, due to the greater number of construction seasons require to complete the project. Implementation of standard mitigation measures in Appendix B as well as following avoidance procedures, would reduce construction-related impacts to localized, short-term, negligible to minor, and adverse.

**Conclusion:** The short-term impacts on wetland vegetation are noted in the 'Wetlands' section, above.

The adherence to mitigation measures and avoidance of vegetation where possible would reduce potential construction related effects on upland vegetation to localized, short-term, negligible to minor, adverse impacts. There would be greater potential for construction-related effects under Alternative 3 due to the longer construction timeframe. In the long-term, with adherence to standard mitigation measures, implementation of Alternatives 2 and 3 would not further disrupt the continuity or integrity of native plant communities.

### Cumulative Impacts

Past projects which contributed to adverse impacts on vegetation within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental buildings, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a localized, short-term, direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have localized, long-term, minor, direct and indirect beneficial impacts on vegetation.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternatives 2 and 3 would likely result in localized, short-term, minor, direct, adverse impacts on vegetation within the project vicinity.

### Impairment

Alternatives 2 and 3 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 2 and 3 would not impair park vegetation.

## Environmental Consequences of Alternative 4

### Analysis

The impact of Alternative 4 would be similar to Alternatives 2 and 3, with the following exceptions: at the most expeditious pace, Alternative 4 would be completed in five years, which would prolong the potential for short-term adverse effects from construction. In addition, Alternative 4 would slightly expand the footprint of the Alpine rental building by approximately 224 square feet at its southeast corner. This expansion would result in a local, long-term, minor, adverse impact on the palustrine emergent wetlands in the project area, as noted under the 'Wetlands' section, above.

**Conclusion:** The short-term impact of Alternative 4 would be the same as under Alternatives 2 and 3, although there would be greater potential for construction-related effects due to the longer construction timeframe. In the long-term, the permanent expansion of the Alpine rental building into wetlands southeast of the lodge would have a local, minor, adverse effect on vegetation resources in the project area.

### Cumulative Impacts

Past projects which contributed to adverse impacts on vegetation within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental buildings, emergency stabilization measures, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a localized, short-term,

direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have localized, long-term, minor, direct and indirect, beneficial impacts on vegetation.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternative 4 would likely result in localized, short-term, minor, direct, adverse impacts on vegetation within the project area.

### **Impairment**

Alternative 4 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternative 4 would not impair park vegetation.

## **Wildlife**

### **Affected Environment**

Yosemite National Park, one of the largest and least-fragmented habitat blocks in the Sierra Nevada, supports a diverse and abundant assemblage of wildlife. Its importance in protecting the long-term survival of certain species and the overall biodiversity of wildlife in the Sierra Nevada has been recognized in reports prepared for the Sierra Nevada Ecosystem Project (UC Davis 1996). The Sierra Nevada Ecosystem Project included assessments of the Sierra Nevada headwaters of 23 major river basins, including the Merced River. Other important studies into the diversity of wildlife in Yosemite include the Re-Survey of the Historic Grinnell-Storer Vertebrate Transect in Yosemite National Park (Moritz 2007), and the Avian Inventory of Yosemite National Park (Siegel and DeSante 2002).

### **Overview of Wildlife**

In the broadest sense, the presence and abundance of wildlife species at any site or area depends on the structure of the habitat available in that area. Habitat areas broadly correlate with vegetation types (or plant associations/communities) or general stream classifications. For many wildlife species, there is an additional requirement for special habitat attributes, such as cliffs, caves, rocks, lakes or rivers, or other abiotic elements. In addition, many species have explicit habitat requirements for one of more elements of the biotic environment, such as large trees, large snags, large downed logs, high degrees of canopy closure, or pools, riffles, and undercut banks.

Eighty-five species of mammals are known to occur in Yosemite. Others, like the California grizzly are extinct, or have disappeared from the park. Mammals include mountain lions, black bears, mule deer, bighorn sheep, coyotes, ringtail, raccoons and a variety of small mammals, such as mice, wood rats, squirrels and chipmunks. Black bears are abundant in the park, and are often involved in conflicts with humans that result in property damage and, occasionally, injuries to humans. Visitor education and bear management efforts have reduced the bear-human incidents and property damage by 90%. Ungulates include large numbers of mule deer. Bighorn sheep formerly were common along the Sierra crest, but have been reduced to several remnant populations.

Five species of shrew and one mole are found in the park. Eighteen species of bats inhabit the park (of these, nine are considered state or federal species of concern). There are six species of squirrels, eight species of chipmunks, and eight species of mice and other rodents, including wood rats, voles, and gophers. Rarely seen, but still present, are fisher, wolverine, and Sierra Nevada red fox (NPS 2004a).

Over 224 species of birds have been recorded in the park. These include resident and migratory species of passerines, raptors, galliforms, and water fowl. Approximately 80% may nest within the park. Many migrate to lower elevations or latitudes in the late summer and fall. Noticeable population declines have been detected in numerous bird species in the Sierra Nevada, including in Yosemite (NPS 2004a).

The park contains a wide variety of reptiles and amphibians – approximately 33 species. Most of these are snakes (14), with seven different lizards, one turtle species, two toads, four frogs, and five kinds of salamanders (VOLPE 1997). At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present; however, they are severely reduced in population size and range. Possible causes of amphibian declines in the Sierra Nevada continue to be studied, but likely include habitat destruction, introduction of non-native fish and frogs, pollution, and diseases.

Most fish in the park were introduced through the stocking of aquatic habitats by the California Department of Fish and Game for recreational fishing. Seven fish are known from the Merced River, including the Sacramento squawfish, Sacramento sucker, golden trout, cutthroat trout, rainbow trout, brown trout, and the Arctic grayling. Naturally occurring rainbow trout in the Merced and Tuolumne Rivers have disappeared due to competition with introduced fish. Historically there were no native fish known to occur above approximately 4,000 feet, due to impassable barriers such as waterfalls and hanging valleys. Of 319 lakes surveyed, slightly more than half contained fish (VOLPE 1997).

Other non-native species found in Yosemite include white-tailed ptarmigans, wild turkeys, brown-headed cowbirds, European starlings, house sparrows, crayfish and bullfrogs. The presence of wild turkeys, white-tailed ptarmigan, bullfrogs, introduced fish and other non-native animal species in Yosemite threatens the park's native species. Bullfrogs, which occupy standing and slow moving water throughout Yosemite Valley, have been implicated in the disappearance of other amphibians. Brown-headed cowbirds have been cited as a cause of the disappearance of willow flycatchers from Yosemite Valley. Wild turkeys likely contribute to reduced seedling survival for oaks, and white-tailed ptarmigan may affect native plants with reduced growth and productivity (NPS 2004a).

### **Wildlife in the Vicinity of Badger Pass**

As described in the Vegetation and Wetlands sections of this chapter, above, the vegetation in the vicinity of Badger Pass Ski Lodge is primarily meadow wetland and red fir forest. Meadows provide important, productive habitat for wildlife. Animals come to feed on the green grasses and use the flowing and standing water found in many meadows. Predators, in turn, are attracted to these areas. The interface between meadow and forest is also favored by many animal species because of the proximity of open areas for foraging, and cover for protection. Species that are highly dependent upon meadow habitat include great gray owls, willow flycatchers, Yosemite toads, and mountain beaver. Species likely to be found in red fir forest communities include golden-mantled ground squirrel, chickaree, marten, Steller's jay, hermit thrush, and northern

goshawk. Reptiles are not common, but include rubber boa, western fence lizard, and alligator lizard (NPS 2007a).

Wildlife commonly found in the general vicinity of Glacier Point Road include the: rubber boa, mountain kingsnake, northern alligator lizard, western fence lizard, goshawk, flammulated owl, black-backed woodpecker, northern flicker, Steller's jay, Clark's nutcracker, great horned owl, American kestrel, common raven, green-tailed towhee, fox sparrow, Lincoln's sparrow, white-crowned sparrow, dark-eyed junco, cotton-tail rabbit, wood rat, white-footed mouse, deer mouse, brush mouse, chipmunk, chickaree, golden-mantled ground squirrel, California ground squirrel, coyote, black bear, and mule deer (NPS 1991). Occasionally, mountain beaver may be found: they have been recorded from the edges of the Badger Pass parking area, Chinquapin, and the surrounding drainages (NPS 1991).

### **Environmental Consequences – Methodology**

Wildlife analysis was based on a qualitative assessment of wildlife that could occur in the project area and the effects anticipated as a result of ongoing maintenance, rehabilitation, and/or construction.

**Context:** The area of potential effect would be detectable only within the vicinity of the proposed action. Thus, the setting or area within which impacts are analyzed would be local.

**Duration:** Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts evaluated below maybe classified as short-term or long-term. Short-term impacts are those that are reversible within one to five years and are associated with a specific event. Long-term impacts are reversible over a longer period of greater than five years and impacts may take place continuously based on reoccurring activity.

**Intensity:** Impact intensity definitions are the same as those defined earlier in this chapter, beginning on page 3-5, under Methods for Analyzing Environmental Consequences, Impacts Analysis - General.

**Type:** Adverse impacts include those that directly remove, relocate, or affect wildlife or wildlife habitat or that affect wildlife or wildlife habitat through increased disturbance. Beneficial impacts result from restoration of wildlife habitat (size, continuity, or integrity).

### **Environmental Consequences of Alternative 1 (No Action)**

#### **Analysis**

There would be no new impacts wildlife species under Alternative 1. Thus, Alternative 1 would result in no effect on wildlife or habitat utilized by these species.

#### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wildlife and wildlife habitat within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental buildings, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in visual and noise disturbance of wildlife within the project area and thus would have a localized, short-term, direct,

adverse impact on wildlife. Relative to the total wildlife habitat within the Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection of wildlife habitat within the project area and thus would have localized, long-term, minor, direct and indirect, beneficial impacts on wildlife.

### **Impairment**

Alternative 1 would result in no change from current conditions. Because no resources specific to the park's purpose would be affected, and there would be no change to either the natural and cultural integrity of the park, or effects to resource values identified in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair wildlife.

## **Environmental Consequences of Alternatives 2, 3, and 4**

### **Analysis**

Alternatives 2, 3, and 4 would have similar effects on wildlife and thus they are analyzed jointly. Design differences of the various alternatives are discussed where they are relevant to wildlife impacts.

Potential impacts may result from noise and visual disturbance associated with increased human presence, construction equipment use, and vehicle traffic. Construction activities that occurred past daylight hours may disturb crepuscular and nocturnal wildlife with the use of construction lighting. The duration of this potential impact varies with each action alternative. It is anticipated that each phase of each alternative be executed over the course of one summer season. At the most expeditious pace, Alternative 2 would be constructed in two years, Alternative 3 in four years, and Alternative 4 in five years; therefore, construction under Alternatives 3 and 4 would have the potential to disrupt seasonal wildlife use of the area to a greater degree than under Alternative 2. With the implementation of mitigation measures (especially during important breeding seasons), noise and visual disturbances to wildlife would be minimized or avoided.

**Conclusion:** Construction under Alternatives 3 and 4 would have the potential to disrupt seasonal wildlife use of the area to a greater degree than under Alternative 2 due to the longer construction timeframe. However, with the implementation of mitigation measures (especially during breeding seasons), noise and visual disturbances to wildlife would be minimized or avoided. Therefore, Alternatives 2, 3, and 4 would result in localized, short-term, negligible to minor, adverse impacts on wildlife.

### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wildlife and wildlife habitat within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, installation of temporary rental buildings, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in visual and noise disturbance of wildlife within the project area and thus would have a localized, short-term, direct, adverse impacts on wildlife. Relative to the total wildlife habitat within the Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection of wildlife habitat within the project area and thus would have localized, long-term, minor, direct and indirect, beneficial impacts on wildlife.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternative 2, 3, and 4 would likely result in localized, short-term, negligible to minor, adverse impacts on wildlife.

### **Impairment**

Alternatives 2, 3, and 4 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 2, 3, and 4 would not impair park wildlife.

### **Special Status Species**

The USFWS and the State of California Department of Fish and Game classify threatened, endangered, or rare species of plants and animals as those that have undergone serious national, state or local declines and which may be threatened with extinction if not otherwise protected. Species that are being monitored because they are undergoing noticeable declines or are threatened by significant loss of habitat, but are not protected by law, may be categorized as rare or sensitive.

Federal and state regulations, including Section 7 of the 1973 Endangered Species Act (USFWS 1998), CEQ regulations, as well as NPS *Management Policies* (NPS 2006), require analysis of whether the proposed actions would cause impacts on any plant or animal species listed or under consideration for listing as threatened or endangered. In addition, Yosemite National Park recognizes state and local rare and sensitive species, and maintains its own list of "park sensitive species." These species may have extremely limited distributions, represent relict populations from past climatic or topographic conditions, or have unique adaptations to local conditions (endemics). Many of these are listed in the California Natural Diversity Database.

### **Affected Environment**

Consultation with the U.S. Fish and Wildlife Service, the California Department of Fish and Game and the National Park Service was used to identify special status species that have the potential to occur within the project vicinity. These species and their protection status are listed below in Table 3-1. A NPS internal scoping process identified 32 special status species that were recognized as species of concern specifically related to this project. These species and the environmental consequences of this project on these species are discussed in further detail below. The environmental consequences of the remaining special status wildlife species, identified in Table 3-1, are addressed in the preceding general wildlife discussion.

**Table 3-1  
Special Status Animal Species with Potential to Occur in the Vicinity of Badger Pass Ski Area**

Species	Federal	State	Other	Park
<b>AMPHIBIANS</b>				
Yosemite toad ( <i>Bufo canorus</i> )	FC	CSC	IUCN:EN USFS:S	PKR
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> )	FC	CSC	IUCN:VU USFS:S	PKR
<b>BIRDS</b>				
Sharp-shinned hawk ( <i>Accipiter striatus</i> )		CWL		PKO
Cooper's hawk ( <i>Accipiter cooperii</i> )		CWL		PKO
Northern goshawk ( <i>Accipiter gentilis</i> )		CSC	BLM:S BSSC CDF:S USFS:S	PKO
Golden eagle ( <i>Aquila chrysaetos</i> )		CFP CWL	BLM:S BSSC CDF:S USFWS:BCC	PKO
Long-eared owl ( <i>Asio otus</i> )		CSC	BSSC	PKR
Flammulated owl ( <i>Otus flammeolus</i> )			ABC:GL AUD:WL USBC:WL USFWS:BCC	PKR
Great gray owl ( <i>Strix nebulosa</i> )		CE	CDF:S USFS:S	PKO
California spotted owl ( <i>Strix occidentalis occidentalis</i> )		CSC	ABC:GL AUD:WL BLM:S BSSC IUCN:NT USBC:WL USFS:S USFWS:BCC	PKO
Vaux's swift ( <i>Chaetura vauxi</i> )		CSC	BSSC	PKO
Rufous hummingbird ( <i>Selasphorus rufus</i> )			ABC:GL AUD:WL USBC:WL USFWS:BCC	PKC
White-headed woodpecker ( <i>Picoides albolarvatus</i> )			ABC:GL AUD:WL USBC:WL USFWS:BCC	PKC
Olive-sided flycatcher ( <i>Contopus cooperi</i> )		CSC	ABC:GL AUD:WL BSSC USBC:WL USFWS:BCC	PKC
Hermit warbler ( <i>Dendroica occidentalis</i> )			ABC:GL AUD:WL	PKC
Yellow warbler ( <i>Dendroica petechia</i> )		CSC	BSSC	PKO
<b>PLANTS</b>				
Yosemite bog-orchid ( <i>Platanthera yosemitensis</i> )				PKR
<b>MAMMALS</b>				
Pallid bat ( <i>Antrozous pallidus</i> )		CSC	BLM:S USFS:S WBWG:H	PKU
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )		CSC	BLM:S IUCN:VU USFS:S WBWG:H	PKU
Spotted bat ( <i>Euderma maculatum</i> )		CSC	BLM:S WBWG:H	PKU
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )			WBWG:M	PKU
Western red bat ( <i>Lasiurus blossevillii</i> )		CSC	USFS:S WBWG:H	PKU
Hoary bat ( <i>Lasiurus cinereus</i> )			WBWG:M	PKU
Western small-footed myotis ( <i>Myotis ciliolabrum</i> )			BLM:S WBWG:M	PKU
Long-eared myotis ( <i>Myotis evotis</i> )			BLM:S WBWG:M	PKU
Fringed myotis ( <i>Myotis thysanodes</i> )			BLM:S WBWG:H	PKU
Long-legged myotis ( <i>Myotis volans</i> )			WBWG:H	PKU
Yuma myotis ( <i>Myotis yumanensis</i> )			BLM:S WBWG:LM	PKU
Western mastiff bat ( <i>Eumops perotis</i> )		CSC	BLM:S	PKU
Sierra Nevada snowshoe hare ( <i>Lepus americanus tahoensis</i> )		CSC		PKR
Sierra Nevada mountain beaver ( <i>Aplodontia rufa californica</i> )		CSC	IUCN:NT	PKR
Pacific fisher ( <i>Martes pennanti</i> )	FC	CSC	BLM:S USFS:S	PKU

Source: Yosemite Special Status Animal Species list, Wildlife Branch, Resources Management & Science, Yosemite National Park, January 2009.

**Key to Table 3-1 Abbreviations****Federal**

FE – Federal Endangered  
 FT – Federal Threatened  
 FC – Federal Candidate  
 FPE – Federal Proposed Endangered  
 FPT – Federal Proposed Threatened

**State**

CE – California Endangered  
 CT – California Threatened  
 CFP – California Fully Protected  
 CP – California Protected  
 CSC – California Species of Concern  
 CWL – California Watch List

**Other**

ABC:GL – American Bird Conservancy Green List  
 AUD:WL – Audubon Watch List  
 BLM:S – Bureau of Land Management Sensitive  
 CDF:S – California Dept of Forestry and Fire Protection Sensitive  
 BSSC – Western Field Ornithologists and California Dept of Fish & Game - California Bird Species of Special Concern  
 IUCN:NT – IUCN - Near Threatened  
 IUCN:VU – IUCN - Vulnerable  
 IUCN:EN – IUCN - Endangered  
 USBC:WL – United States Bird Conservation Watch List  
 USFS:S – U.S. Forest Service Sensitive  
 USFWS:BCC – U. S. Fish & Wildlife Service Birds of Conservation Concern  
 WBWG:H – Western Bat Working Group - High Priority  
 WBWG:LM – Western Bat Working Group - Low-Medium Priority  
 WBWG:M – Western Bat Working Group - Medium Priority  
 WBWG:MH – Western Bat Working Group - Medium-High Priority

**Park**Park Status

PK – Presently known to occur in park  
 PH – Historically found in park; present status unknown  
 PB – Found near and outside park boundaries  
 PE – Expected in park, but no current or historic records  
 PX – Previously found in park, now extirpated  
 PN – Non-native, introduced species to Yosemite

Park Abundance

A – Abundant, can be seen daily in preferred habitat  
 C – Common, can be seen often in preferred habitat  
 O – Occasional, seen infrequently in preferred habitat  
 R – Rare, seen only on rare occasions in preferred habitat  
 U – Unknown status

**Federally Threatened or Endangered Species**

The U.S. Fish and Wildlife Service provided a species list that included federally listed threatened and endangered species as well as proposed and candidate species for this project. Aided by this list, park data, and professional judgment, it was determined that no federally listed threatened, endangered or proposed species are known to occur within the Badger Pass Ski Lodge project vicinity. The Yosemite toad (*Bufo canorus*), Sierra Nevada yellow-legged frog (*Rana sierra*) and Pacific fisher (*Martes pennanti*) are candidate species that have may occur within the Badger Pass Ski Lodge project vicinity.

**Critical Habitat**

No critical habitat has been designated for any federally listed species within the project area.

**Special Status Plants**

According to the park *Vegetation Management Plan* (NPS 1997b), the relative isolation of ecosystems in the Sierra Nevada has resulted in a high degree of endemism, particularly for plants. Many of these endemic plants are considered rare within the park and are given special protection. Four plants known to occur in Yosemite National Park or the El Portal Administrative Site are listed as “rare” by the state of California. All are known to occur in Lower Montane and Foothills Woodland zones. They occur near the western park boundary below 6,000 feet and below the elevation of Badger Pass Ski Area.

The special status plant species listed below have the highest potential likelihood for presence in the Badger Pass Ski Lodge project vicinity. Other special status plant species would not be expected to be affected by the proposed project because suitable potential habitat is not present in

the project area or surveys of the project area have demonstrated their absence. No critical habitat has been designated for any plant species within the proposed project area.

**Yosemite bog-orchid** (*Platanthera yosemitensis*): This extremely rare orchid was first described in 2007. The plant has an extremely localized distribution. *Platanthera yosemitensis* has been recorded in Monroe Meadow, south of the ski lodge (Colwell et al 2007). Impacts on this plant should be avoided. Potential impacts that should be avoided include direct physical destruction of the plant and its immediate surroundings or changes in the natural processes that sustain the orchid, such as surface water and groundwater flows. Preconstruction surveys should be made in other potential habitat in the appropriate season for detection. Survey protocols should follow the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1998). If the plant is found, the plant should either be avoided or consultation should be initiated with the National Park Service to determine if there are other mitigation alternatives.

### Special Status Wildlife

According to the park's website, despite the richness of high-quality habitats in Yosemite, three species have become extinct in the park within historical time, and another 37 species currently have special status under either California or federal endangered species legislation. The most serious current threats to Yosemite's wildlife and the ecosystems they occupy include habitat fragmentation, introduction of exotic species, deviation from the natural fire regime, air pollution, and climate change. Locally, factors such as road kills and the availability of human food have also affected some wildlife species. A scoping process with the National Park Service has identified the following special status wildlife species below as having the highest potential of being affected by the Badger Pass Ski Lodge Rehabilitation project. No critical habitat has been designated for any wildlife species within the proposed project area.

**Bat species:** Several species of bats that could be in the area have special status: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), silver-haired bat (*Lasionycteris noctivagans*), western red bat (*Lasiurus blossevillei*), hoary bat (*Lasiurus cinereus*), and western small-footed myotis (*Myotis ciliolabrum*). No evidence exists of a substantial bat colony using the ski lodge or other adjacent structures. The Badger Pass Ski Lodge, with its open beam design, fails to provide suitable roosting habitat for colonies (NPS 2009b).

**Great gray owl** (*Strix nebulosa*): This raptor species has been observed foraging in the meadows formed by the ski runs. Nest sites have been documented along Glacier Point Road but no nest sites have been observed within the Badger Pass Ski Area (NPS 2009b).

**California spotted owl** (*Gambelia silus*): This raptor species is known to occur in the vicinity of the Badger Pass Ski Area. Spotted owls were identified within 5 miles of the ski area within the last 15 years. No nest sites have been observed within the Badger Pass Ski Area (NPS 2009b).

**Sierra Nevada mountain beaver** (*Aplodontia rufa californica*): This rodent is known to live along drainages within the immediate vicinity of the Badger Pass area. Its preferred habitat includes perennial streams that traverse meadows and willow thickets. Perennial water is required due to inefficient kidneys that require the mountain beaver to drink large amounts of water each day. Thus, effects on water quality in the area are of concern (NPS 2009b). This species is listed as 'rare' within Yosemite National Park and is on the state of California's species of concern list.

**Pacific fisher** (*Martes pennanti*): Based upon collected road kill data, evidence suggests that the Chinquapin area may support a high population of Pacific fisher (NPS 2009b). Fishers are highly elusive, fast, nocturnal animals, making it difficult to determine their status in Yosemite. There have been several fisher sightings and road kills in Yosemite; however, none of the known natal and maternal dens in the Sierra Nevada are located in Yosemite (NPS 2010). Due to the close proximity of the Badger Pass Ski Area and the Chinquapin area, the Pacific fisher may be present within the project area.

**Sierra Nevada yellow-legged frog** (*Rana sierrae*), **Yosemite toad** (*Bufo canorus*): Although documentation of the presence of these species is lacking, the wet meadow and elevation of the Badger Pass Ski Lodge matches the habitat requirements for these Federal Candidate Species.

## Environmental Consequences – Methodology

Please see the discussion of Special Status Species impact methodologies at the introduction of this chapter, beginning on page 3-6.

The analysis below was based on the known or likely occurrence of the species in the vicinity of the project area, the potential loss of habitat for the species, and the alteration of habitat.

**Type:** Adverse impacts are those that alter the range, location, number or population of a species or its habitat. Beneficial impacts would improve one or more of these characteristics.

**Wildlife:** The impact evaluation for special status wildlife species was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss or adverse modification of habitat; (3) the effective loss of habitat (through avoidance or abandonment) due to construction activity or noise, or the species' sensitivity to human disturbance.

**Plants:** The impact evaluation for special status plant species was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss of habitat; (3) the effective loss of habitat through loss of habitat features such as surface water flows.

Surveys specific to this planning effort to identify individuals or populations of special status species within the project area have not been performed. Data presented herein are based on field reconnaissance, the professional knowledge and judgment of park staff, records of observations, published references, and studies of selected species.

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

There would be no new impacts on special status species under Alternative 1. Thus, Alternative 1 would result in no effect on special status species or habitat utilized by these species.

### Cumulative Impacts

Past projects which may have contributed to adverse impacts on special status species within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, emergency stabilization measures, installation of

temporary rental buildings, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in a minor disturbance of special status species habitat within the project area and would have a localized, short-term, direct, adverse impact.

Potential actions under the park's *Invasive Plant Management Plan* and *Fire Management Plan* would result in the protection of special status species populations and habitat within the project area and thus would likely have localized, long-term, minor, direct and indirect, beneficial, direct and indirect, long-term, minor impacts on special status species in the project area.

### **Impairment**

Alternative 1 (No Action) would result in no change from current conditions. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, nor effects to resource value identified in the 1980 *Yosemite General Management Plan*, Alternative 1 would not impair park special status species.

## **Environmental Consequences of Alternatives 2, 3, and 4**

### **Analysis**

Alternatives 2, 3, and 4 would have similar effects on special status species and thus they are analyzed jointly. Design differences of the various alternatives are discussed where they are relevant to special status species impacts.

The vicinity of the Badger Pass Ski Lodge is known habitat for the great gray owl, the California spotted owl, and is considered suitable habitat for the Pacific fisher. Construction activities that affect the meadows could affect all three species. Noise and visual disturbance associated with increased human presence, construction equipment use, and vehicle traffic would affect owls in particular, which detect their prey primarily by sound, and would thus affect foraging and breeding success of these species. Disturbance during the breeding and nesting periods for owls (great gray owls breed from March through August, and California spotted owls breed from approximately February to September) could result in impacts on reproductive success, which could affect local populations.

The construction areas are the same for all action alternatives, however, the duration of this potential impact varies with each action alternative. It is anticipated that each phase of each alternative be executed over the course of one summer season. At the most expeditious pace, Alternative 2 would be constructed in two years, Alternative 3 in four years, and Alternative 4 in five years; therefore, construction under Alternatives 3 and 4 would have the potential to disrupt special status species to a greater degree than under Alternative 2. With implementation of mitigation measures including presence/absence surveys before and during the breeding season and proper mitigation measures prior to each construction season, potential impacts on this species would be minimized or avoided and would potentially result in localized, short to long-term, minor, adverse impacts.

The Yosemite Bog Orchid has been observed within Monroe Meadow and would be adversely affected in the construction zone if it is present there. The Yosemite bog-orchid is extremely rare; avoidance is assumed for this project. With implementation of mitigation measures (see Appendix B) that include presence/absence surveys prior to each construction season and a focus on avoidance, potential impacts on this species would be avoided.

Dewatering activities and water runoff from impermeable surfaces could potentially cause sediment-laden and/or contaminated water to enter Grouse Creek during construction and resulting in an adverse impact on the Sierra Nevada Mountain Beaver, which is known to inhabit portions of Monroe Meadow and portions of Grouse Creek, and the Sierra Nevada yellow-legged frog and the Yosemite toad, which have the potential to reside within the Badger Pass Ski Area. The potential impacts of dewatering are discussed in detail in the Hydrology section of this chapter. Implementation of standard mitigation measures and those recommended in the Hydrology section of this chapter, as well as following avoidance procedures would reduce impacts on this species localized, short-term, negligible to minor, and adverse.

**Conclusion:** Under all action alternatives, project construction would occur in suitable habitat for a number of special status species, but implementation of mitigation measures with a focus upon avoidance, limiting construction activities during breeding seasons, and limiting areas of impacts would reduce potential adverse effects. Construction activities under Alternatives 3 and 4 would have the potential to disrupt special status species to a greater degree than under Alternative 2 due to the longer construction timeframe. Overall, Alternatives 2, 3, and 4 would result in localized, short-term, negligible to minor, adverse impacts on special status species. Therefore, Alternatives 2, 3, and 4 may affect, but are not likely to adversely affect special status species.

### **Cumulative Impacts**

Past projects which contributed to adverse impacts on wetlands within the project area include the construction, modification, and expansion of the ski lodge and parking areas; past and present routine maintenance activities, demolition of the Alpine rental shop and subsequent natural resource restoration, emergency stabilization measures, installation of temporary rental buildings, and the replacement of the Badger, Bruin, and Eagle ski lifts. These actions would result in a minor disturbance of special status species within the project area and would have localized, short-term, direct, adverse impact.

Potential actions under the park's *Invasive Plant Management Plan* and *Fire Management Plan* would result in the protection of special status species populations within the project area and thus would have localized, long-term, minor beneficial, impacts on special status species in the project area. The construction of the Yosemite Environmental Education Center would potentially have a long-term, moderate adverse impact on great gray owls, California spotted owls, and Pacific fishers in the Henness Ridge area (NPS 2010). If construction activities on the campus coincided with ski lodge rehabilitation construction, there would be a potential for adverse effects on these species in the region.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternatives 2, 3, and 4 would likely result in localized, short-term and long-term, minor to moderate, adverse impacts on special status species wildlife within the project vicinity and long-term, negligible, adverse impacts on special status plant species.

### **Impairment**

Alternatives 2, 3, and 4 would result in minor, localized changes from current conditions. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 2, 3, and 4 would not impair park special status species.

## **Air Quality**

### **Affected Environment**

#### **Regulatory Setting**

Yosemite National Park is classified as a mandatory Class I area under the 1970 Clean Air Act, as amended (42 USC 7401 et seq.). This air quality classification was enacted to protect national parks and wilderness areas from air quality degradation. Class I designation gives federal land managers the responsibility for protecting air quality related values in Class I areas from the adverse effects of new or modified sources of emissions. Vegetation, visibility, water quality, wildlife, historic and prehistoric structures and objects, cultural landscapes, and most other elements of a park environment are sensitive to air pollution and are considered by the National Park Service to be air quality-related values.

In addition, the 1970 Clean Air Act requires the EPA to establish National Ambient Air Quality Standards and periodically reassess whether these standards are adequate to protect public health and the national welfare, including those resources and values associated with national parks and wilderness areas. The EPA has set national standards for six pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter less than 2.5 and 10 microns (PM-2.5 and PM-10). Under the 1988 California Clean Air Act the California Air Resources Board (CARB) has adopted standards for these criteria pollutants and applied additional standards for pollutants that are not currently included in the national standards. The federal and state ambient standards differ in some cases; in general, the California standards are more stringent, particularly for ozone and PM-10.

The state of California is divided into air basins that are routinely monitored using both federal and state air quality standards. Badger Pass is located in Mariposa County, near the southern end of the Mountain Counties Air Basin. Currently, all of Mariposa County is a *nonattainment* area for the national and state 8-hour ozone standards and is *unclassified* (meaning there is insufficient data to make determination) for fine particulate material (EPA 2009; CARB 2009). Activities that affect air quality in Mariposa County are regulated by the Mariposa County Air Pollution Control District, which is responsible for developing a state implementation plan for federal and state nonattainment pollutants. Current county regulations for maximum discharges of fossil fuel steam generator facilities (new or expanded) are: 200 lbs/hour of sulfur dioxide (SO<sub>2</sub>), 140 lbs/hour of nitrogen dioxide (NO<sub>2</sub>), and 10 lbs/hour of combustion contaminants (i.e., particulate matter) (Page & Turnbull 2009a).

#### **National Park Service Air Quality Plans and Policies**

Under the Organic Act and Clean Air Act, the National Park Service has a responsibility to protect air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. According to the NPS *Management Policies 2006*, the National Park Service is obligated to “promote and pursue measures to protect [air quality related] values from the adverse impacts of air pollution” (NPS 2006).

It is also NPS policy that internal activities at parks must comply with all applicable federal state, and local air pollution laws and regulations (NPS 2004b). In order to meet these goals, parks may be required to obtain air quality permits before conducting activities, such as prescribed burning, that emit pollutants. Likewise, operating permits may be required for some emission sources, such

as generators and boilers. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the National Park Service would err on the side of protecting air quality and related values for future generations (NPS 2006).

The 1980 *Yosemite General Management Plan* does not specifically address air quality at Badger Pass, although it does call for the National Park Service to limit unnatural sources of air pollution to the greatest extent possible.

### **Climate and Meteorology**

Air quality in Yosemite National Park is tied to atmospheric conditions that funnel air pollutants from the Central Valley of California up west-facing canyons to higher elevations. This mechanism for pollutant transport is strongest in summer, nearly nonexistent in winter, and more pronounced in the southern portion of the Sierra Nevada range. In winter, the air quality in Sierra Nevada, particularly in remote areas, is considered some of the cleanest in the nation. This is largely because these areas are above wintertime inversion heights, leaving pollutants from source areas to the west trapped in California's Central Valley. This allows the higher elevations of the Sierra to receive the relatively pristine air that flows eastward from over the Pacific Ocean (Tarnay 2009; UC Davis 1996).

### **Existing Conditions**

In general, air quality in the region where Badger Pass is located follows that of the rest of western slope of the Sierra Nevada, regularly exceeding California state ozone standards during the hot, dry summer months, and occasionally exceeding California fine particle standards when smoke plumes from large regional fires or small local fires blow over the area. Ongoing NPS air quality monitoring at Turtleback Dome and, in 2008, at Glacier Point confirms that this summer pattern likely extends to the elevation at which Badger Pass rests. As in other parts of the Sierra Nevada, air quality in wintertime at this elevation is excellent (Tarnay 2009).

Existing sources of emissions in the vicinity of the project area include both stationary and mobile sources, including campfires and wildland fires (primarily in summer), vehicle exhaust along Glacier Point Road and the Badger Pass Ski Area access road, and equipment used to maintain Badger Pass Ski Area and the Badger Pass Ski Lodge during winter (e.g., heating systems, grooming equipment).

The ski lodge is heated by two diesel-fuel-fired water-tube steam boilers manufactured in 1982. The boilers are oversized for the current heating load of the building. Because the boilers are almost 30 years old, they are due for replacement. The building domestic hot water is generated by two steam-fired domestic hot water generators. Domestic hot water heat exchangers are reportedly double-wall as required by current code (Page & Turnbull 2009a).

The temporary Alpine rental building and the main lodge building kitchen are served by propane. The propane system is in fair condition. The emergency electrical power system consists of a 60 kW generator (Page & Turnbull 2009a).

There are no mechanical ventilation systems within the ski lodge. The lack of mechanical ventilation results in spaces that are not provided with ventilation in amounts consistent with current codes and standards.

### **Sensitive Receptors**

Relevant population groups with an increased susceptibility to respiratory distress associated with poor air quality include children, the elderly, and persons engaged in strenuous work or exercise. Recreational areas are considered sensitive compared to commercial and industrial areas due to the greater exposure to ambient air associated with outdoor activities. Onsite staff and recreational users at Badger Pass would be the closest sensitive receptors to activities associated with this project.

### **Environmental Consequences – Methodology**

The air quality analysis was based on a qualitative analysis of air emissions from construction and removal activities as well as long-term operations of facilities. The creation of pollutants resulting from the implementation of an alternative can contribute to an impact on air quality; however, air quality is a regional issue that is influenced by factors outside the immediate area. In addition, many air quality issues are related to non-construction vehicles and air quality analysis often focuses on vehicle emissions related to increases or decreases in traffic volumes. Since this project is not expected to affect non-construction vehicle trips or traffic volumes, non-construction vehicular emissions are not addressed.

Air quality impacts were evaluated in terms of intensity and duration and whether the impacts were considered beneficial or adverse. Cumulative effects on air quality were also considered based on past, present, and reasonably foreseeable future actions occurring in Yosemite National Park, in combination with the potential air quality effects of each alternative.

**Intensity:** The intensity of an impact considers whether the impact is judged negligible, minor, moderate, or major relative to existing air quality conditions.

**Type:** Impacts were considered beneficial or adverse to air quality. Beneficial air quality impacts would reduce emissions or lower pollutant concentrations, while adverse impacts would increase emissions or raise pollutant concentrations.

### **Environmental Consequences of Alternative 1 (No Action)**

#### **Analysis**

**Construction-related impacts:** There would be no construction-related impacts on air quality under this alternative.

**Long-term impacts:** Under the No Action Alternative, the two existing diesel-fired boilers would remain in place to heat the ski lodge, and the two existing steam-fired hot water generators would continue to be used for domestic hot water. In spite of their age, the boilers are of extremely high quality and could be operated for an additional 10 to 12 years with proper maintenance (with increasing maintenance costs to be anticipated) (Page & Turnbull 2009a). Based on the age of the boilers, it is expected that they exceed current county code for emissions, although precise measurements would have to be made to determine to what extent.

The temporary Alpine rental building and the main lodge kitchen would continue to be served by propane, which has a low level of emissions in comparison with diesel fuel. The emergency generator would remain in place as well.

Current levels of use of these systems, and therefore, current levels of emissions, are expected to continue under the No Action Alternative. These systems would contribute to air pollution; however, impacts on air quality would be low. Pollution from these sources would be generated primarily during winter months when air quality in the area is generally excellent. Any contribution to air pollution from these sources when regional air quality exceeds state standards would be very minimal.

**Conclusion:** Under Alternative 1, emissions from existing diesel- and propane-fired systems at the ski lodge would continue to have a long-term, negligible, adverse impact on local and regional air quality.

### **Cumulative Impacts**

Short-term adverse impacts on air quality could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park. Work at Badger Pass would include remediation of soil contamination in conjunction with this rehabilitation project. Nearby work that could contribute to impacts on local air quality include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. In addition, wildland fires in the park, managed in accordance with the 2004 *Fire Management Plan*, could adversely impact local and regional air quality. The adverse effects of these construction activities would be localized and short-term in nature.

Past actions at Badger Pass that may have negligible long-term impacts on air quality include work in the Badger Pass parking lot associated with the Glacier Point Road rehabilitation project, which may have included emissions from construction activities and asphalt paving, changes to food service in the ski lodge, which may have affected fuel consumption, and the replacement of an old ski lift drive engine, which likely lessened emissions.

Cumulative impacts on air quality due to these actions would result in short-term and long-term, negligible to minor, adverse impacts to local and regional air quality.

### **Impairment**

Implementation of the No Action Alternative is expected to result in long-term, negligible, adverse impacts on local and regional air quality. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternative 1 would not be expected to impair park air quality.

## **Environmental Consequences of Alternative 2**

### **Analysis**

**Construction-related impacts:** Air quality effects associated with demolition, rehabilitation, and construction include temporary engine and dust emissions from a variety of sources. These activities could generate substantial amounts of dust, including PM-10 (primarily fugitive dust from demolition activities and tailpipe emissions from the operation of heavy-duty equipment). Dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and weather conditions. Emissions generated from construction and demolition activities would also include tailpipe emissions from heavy-duty equipment, worker commute trips, and truck trips to haul debris materials from Badger Pass Ski Area to appropriate recycling facilities or reuse sites and to supply the site with new construction materials. Both mobile and

stationary equipment would generate emissions of ozone precursors, carbon monoxide, and PM-2.5 (criteria air pollutants) as well as toxic air contaminants from use of diesel-powered equipment. Toxic air contaminants are less pervasive in the atmosphere than criteria air pollutants, but they are linked to short-term (acute) and long-term (chronic or carcinogenic) adverse human health effects. Toxic air contaminants do not have corresponding ambient air quality standards.

Implementation of Alternative 2 would be expected to require two seasons of construction. The temporary duration of the construction period would limit the potential for tailpipe emissions and diesel particulates to adversely affect local air quality. Construction is not expected to impact air quality during the winter season, when the majority of recreational users would be present in the area. Because construction would take place during the summer when the area is little-used, little to no sensitive receptors would be exposed to high concentrations of demolition or construction emissions.

**Long-term impacts:** Under all action alternatives, the boilers and hot water generators would be replaced with more energy efficient models. The new energy efficient boilers would be sized to provide for proposed improvements to the ventilation system throughout the lodge and installation of a snow melt system for the deck, and to provide 100% capacity redundancy. The new boilers would require county permits, so would not exceed the current regulations for emissions. If the diesel-fired boilers were replaced with propane-fired boilers, emissions would be lower than if they were replaced with newer diesel-fired models, but overall emissions are expected to be lower than they are currently under either scenario.

Current propane systems would remain in place under all action alternatives and would be expected to continue at the current levels of use and emissions, with the exception of the potential changes addressed above.

In addition, a new, 200kW emergency generator would be provided. The larger generator is needed to support backup for the entire building. This is expected to cause a negligible increase in emissions, since the generator would be used only rarely, and it is assumed that it would be a more efficient model than the current unit.

Code-compliant mechanical ventilation would be provided to the ski lodge and new Alpine and Nordic rental buildings under all action alternatives.

Lastly, new finish materials would possibly contain recycled content, low VOC-content materials, and reuse of existing materials, which would improve the indoor air quality of the facility.

**Conclusion:** Implementation of Alternative 2 would result in a short-term, negligible, adverse impact on local air quality during two summer seasons, due to construction-related dust and equipment and vehicle emissions. Under all action alternatives, diesel-fired boilers and an emergency generator would be replaced with more efficient models, mechanical ventilation would be provided throughout the complex, and low-emission finish materials would be used where possible. This would result in a long-term, negligible to minor, beneficial impact on indoor, local, and regional air quality.

### **Cumulative Impacts**

Short-term adverse impacts on air quality could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park.

Work at Badger Pass would include remediation of soil contamination in conjunction with this rehabilitation project. Nearby work that could contribute to impacts on local air quality include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. In addition, wildland fires in the park, managed in accordance with the 2004 *Fire Management Plan*, could adversely impact local and regional air quality. The adverse effects these construction activities would be localized and short-term in nature.

Past actions at Badger Pass that may have negligible long-term impacts on air quality include work in the Badger Pass parking lot associated with the Glacier Point Road rehabilitation project, which may have included emissions from construction activities and asphalt paving, changes to food service in the ski lodge, which may have affected fuel consumption, and the replacement of an old ski lift drive engine, which likely lessened emissions.

Cumulative impacts on air quality due to these actions would result in short-term, negligible to minor, adverse and long-term, negligible, beneficial impacts on local and regional air quality.

### **Impairment**

Implementation of Alternative 2 is expected to result in short-term, negligible, adverse and long-term, negligible to minor impacts on local and regional air quality. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternative 2 would not be expected to impair park air quality.

## **Environmental Consequences of Alternatives 3 and 4**

### **Analysis**

Alternatives 3 and 4 would have similar effects on air quality and thus they are analyzed jointly.

**Construction-related impacts:** Implementation of Alternatives 3 or 4 is expected to require four or five seasons of construction, respectively. Types and levels of air quality effects associated with demolition, rehabilitation, and construction activities would be the same as those described for Alternative 2, but would extend over a longer period of time.

**Long-term impacts:** Long-term impacts under Alternatives 3 or 4 would be the same as long-term impacts under Alternative 2, with the following difference. The addition of a fireplace to the ski lodge under either of these alternatives would add some emissions to the atmosphere; the amount would depend on whether the fireplace was wood-burning or propane, the size of the hearth, weather, and operational policy. Use of the fireplace would reduce some demand on the main heating system of the lodge.

**Conclusion:** Implementation of Alternative 3 or 4 would result in a short-term, negligible, adverse impact on local air quality during four or five summer seasons, respectively, due to construction-related dust and equipment and vehicle emissions. Under all action alternatives, diesel-fired boilers and an emergency generator would be replaced with more efficient models, mechanical ventilation would be provided throughout the complex, and low-emission finish materials would be used where possible. Under Alternatives 3 and 4, a wood-burning or propane fireplace would be added in the ski lodge; emissions would be dependent upon the type of fuel used, the size of the

hearth, weather, and operational policy. Overall, these actions would result in a long-term, negligible to minor, beneficial impact on indoor, local and regional air quality.

### **Cumulative Impacts**

Short-term adverse impacts on air quality could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park. Work at Badger Pass would include remediation of soil contamination in conjunction with this rehabilitation project. Nearby work that could contribute to impacts on local air quality include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. In addition, wildland fires in the park, managed in accordance with the 2004 *Fire Management Plan*, could adversely impact local and regional air quality. The adverse effects these construction activities would be localized and short-term in nature.

Past actions at Badger Pass that may have negligible long-term impacts on air quality include work in the Badger Pass parking lot associated with the Glacier Point Road rehabilitation project, which may have included emissions from construction activities and asphalt paving, changes to food service in the ski lodge, which may have affected fuel consumption, and the replacement of an old ski lift drive engine, which likely lessened emissions.

Cumulative impacts on air quality due to these actions would result in short-term, negligible to minor, adverse and long-term, negligible, beneficial impacts on local and regional air quality.

### **Impairment**

Implementation of Alternatives 3 or 4 is expected to result in short-term, negligible, adverse and long-term, negligible to minor impacts on local and regional air quality. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 3 or 4 would not be expected to impair park air quality.

## **Soundscapes**

### **Affected Environment**

A soundscape refers to the total acoustic environment of an area. Both natural and human sounds may be desirable and appropriate in a soundscape. By definition, “noise” is human-caused sound that is considered unpleasant and unwanted. Whether a sound is considered unpleasant depends on the individual listening to the sound and what the individual is doing when the sound is heard (e.g., working, playing, resting, or sleeping).

Protecting natural sounds is important both to the visitor experience and the ecological integrity of natural resources in Yosemite National Park. National parks provide visitors refuge from noise, where they can instead become attuned to the historic and natural character of the area. Natural soundscapes are also important to wildlife: birds use sound to define territories, attract mates, and even navigate dense forest canopies, while other animal species use sound to keep track of predators and prey.

### **National Park Service Standards and Regulations**

NPS management policies direct parks to “preserve, to the greatest extent possible, the natural soundscapes of parks.” This includes restoring soundscapes to natural conditions if they have

become degraded by unnatural sound (noise) and protecting natural soundscapes from ‘unacceptable impacts’. It is up to park managers to decide what constitutes acceptable impacts on natural soundscapes, recognizing that “frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas” (NPS 2006).

The current interpretation of these soundscape policies is that the National Park Service must protect natural sound environments, but also address what might be appropriate levels of human-generated sound in light of why a park was established. For instance, some human sounds may be entirely appropriate for the purposes of interpretation and increased understanding of park resources. Examples include interpretive talks or American Indian traditional cultural use (NPS 2007b).

At Yosemite National Park, the *Yosemite General Management Plan* does not specifically address soundscapes at Badger Pass Ski Area, although it does call for the National Park Service to limit unnatural sources of sound to the greatest extent possible.

### **Existing Sources of Sound**

Natural sounds at Badger Pass result from sources such as birds, animals, and wind in the trees. The existing human sounds at Badger Pass change character through the seasons. During the winter, ski lift operations and the general clatter resulting from the movement of ski gear and boots are present. The winter season also normally has the sound of human voices, such as talking and yelling. Human sounds at Badger Pass are lower and less frequent during the summer season, since there are fewer people present.

Ambient background noises include mechanical sources such as motor vehicles, transit buses, maintenance equipment, mechanical devices associated with building operations, and aircraft flying overhead, and are present year-round. Noise from motor vehicle traffic including buses at Badger Pass would be higher during the winter, but background noise from vehicles on Glacier Point Road would be higher during the summer.

### **Environmental Consequences – Methodology**

Sound and noise levels are measured in units known as decibels (dB). For the purpose of this analysis, sound and noise levels are expressed in decibels on the “A” weighted scale (dBA). This scale most closely approximates the response characteristics of the human ear to low-level sound. Human hearing ranges from the threshold of hearing (0 dBA) to the threshold of pain (140 dBA). As a point of reference, a conversation between two people would typically measure about 60 dBA. A noise level above 80 dBA can cause hearing loss if prolonged. Impacts related to noise were assessed in terms of duration, type, and intensity of impact, as discussed below.

**Intensity:** The level of impact (negligible, minor, moderate, or major) of each alternative to soundscapes was evaluated using the following definitions. A negligible impact indicates the change in sound levels would not be perceptible. A minor impact indicates the change in sound levels would be perceptible, but not likely to have a substantial annoyance effect on visitors or residents in the area. A moderate impact indicates the change in sound levels would be easily perceptible and likely to result in annoyance to some park visitors and residents. A major impact indicates the change in sound levels would be very perceptible and likely to annoy most park visitors and residents who experience it.

**Type:** Beneficial impacts are those impacts that result in less noise, and adverse impacts are those impacts that result in more noise.

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

Noise generated by activities associated with regular ski area operations would continue to affect ambient noise levels in the vicinity of Badger Pass Ski Lodge. Sounds generated by ski area operations would continue to include human voices, noise associated with ski activities, and vehicle noise. In summer, human sounds would normally be limited to those associated with YCC employees, and occasional hikers. Additionally, there would be recurrent periods of mechanical, vehicular, and human noise associated with routine maintenance and emergency repairs at the ski lodge, and fixed-wing and rotor aircraft noise from emergency medical services, search and rescue, and wildland fire activities.

These sounds contribute to the existing noise levels in the vicinity of the ski area although they are higher than ambient noise levels. Park visitors using the ski area and cross-country ski trails in the immediate vicinity would notice noise generated by ski area operations when other sounds (e.g., wind or vehicle noise) do not intervene. These noises are unlikely to be heard beyond the immediate vicinity of the ski area.

**Conclusion:** Under Alternative 1, noise associated with continued ski area operations in the winter, and limited use of the ski area during the summer, would have a local, long-term, negligible to minor, adverse impact on soundscapes.

### Cumulative Impacts

Short-term adverse impacts on ambient noise levels could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park. Work at Badger Pass Ski Area would include remediation of soil contamination in conjunction with this rehabilitation project. Nearby work that could contribute to background noise include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-generated traffic on roadways serving the area around Badger Pass and nearby on Wawona Road. Cumulative noise generated by these construction actions would result in a local, short-term, negligible to minor, adverse impact on the ambient noise environment along park roads.

Past construction projects at and in the vicinity of Badger Pass would not have a cumulative impact with the No Action Alternative, because their impacts on soundscapes were temporary in nature and have ended.

### Impairment

Though operation-related impacts would include some adverse effects to soundscapes, the park's soundscape would not be impaired under this alternative.

## Environmental Consequences of Alternatives 2, 3 and 4

Alternatives 2, 3, and 4 would have similar effects on soundscapes and thus they are analyzed jointly. Design differences of the various alternatives are discussed where they are relevant to soundscapes.

### Analysis

Impacts on soundscapes under these alternatives would be limited to short-term impacts due to construction-related noises. Implementation of Alternatives 2, 3, and 4 would be expected to require two, four, and five seasons of construction, respectively. Therefore, construction under Alternatives 3 and 4 would have the potential to disrupt natural soundscapes to a greater degree than under Alternative 2, with the greatest potential for impact under Alternative 4. There would be no long-term impact on soundscapes, as compared to the No Action Alternative.

The type of noise generated during the construction period would include the operation of heavy equipment, voices of construction workers, handheld manual and power tools (e.g., hammers, drills, and saws) and noise associated with material haul vehicles. Table 3-2 provides typical noise levels generated by various types of heavy equipment that could be used during construction activities. These noise levels are expected to be substantially higher than the existing ambient noise at the ski area, with some equipment potentially doubling the noise levels.

**Table 3-2  
Typical Construction Equipment Noise Levels**

Equipment	Typical Noise Level (dBA) 50 Feet from the Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88

dBA = A-weighted decibels  
Source: Federal Transit Administration 2006

Operation of heavy equipment could generate substantial amounts of noise in the vicinity of Badger Pass Ski Area. Such noise could affect wildlife, onsite staff, and nearby recreational users,

but recreational users are expected to be few, since construction would take place during the summer when the area is little-used, with the exception of YCC groups and associated staff. Construction is not expected to impact the soundscape during the winter season, when the majority of recreational users would be present in the area. Noise effects in the construction area would vary depending upon a number of factors, such as the number and types of equipment in operation on a given day, usage rates, the level of background noise in the area, and the distance between sensitive uses and demolition and construction activities.

**Conclusion:** Implementation of Alternatives 2, 3, or 4 would result in elevated levels of noise in the vicinity of Badger Pass Ski Area due to construction-related activities during the summer season. All of the action alternatives would potentially affect wildlife, onsite staff, and nearby recreational users, although the number of recreational users is generally low in the summer season. Alternatives 3 and 4 would have the potential to disrupt natural soundscapes to a greater degree than Alternative 2 due to their longer construction timeframes. Overall, these alternatives would cause a local, short-term, minor, adverse impact on soundscapes.

### **Cumulative Impacts**

Short-term adverse impacts on ambient noise levels could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park. Work at Badger Pass Ski Area that could occur concurrently with the proposed actions would include remediation of soil contamination in conjunction with this rehabilitation project. Nearby work that could contribute to background noise include construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-generated traffic on roadways serving the area around Badger Pass and nearby on Wawona Road. Cumulative noise generated by these construction actions would result in a local, short-term, negligible to minor, adverse impact on the ambient noise environment along park roads.

Past construction projects at and in the vicinity of Badger Pass would not have a cumulative impact with the proposed project, because their impacts on soundscapes were temporary in nature and would not continue during the proposed project.

### **Impairment**

Implementation of Alternatives 2, 3, or 4 is expected to result in short-term, minor, adverse impacts on the local soundscape. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 *Yosemite General Management Plan*. Thus, Alternatives 2, 3 and 4 would not be expected to impair park soundscapes.

## **Sociocultural Resources**

### **Visitor Experience and Recreation**

#### **Affected Environment**

Stewardship of Yosemite National Park requires the consideration of two integrated purposes: (1) to preserve Yosemite's unique natural and cultural resources and scenic beauty, and (2) to make these resources available to visitors for study, enjoyment, and recreation. The Badger Pass Ski Area is a special place for many visitors to Yosemite National Park. Multiple generations of skiers have learned or brought others to learn to ski at Badger Pass.

The Yosemite Winter Club, the first California winter sports organization, was formed in 1928 by the Yosemite Park & Curry Company to foster the development of winter sports, promote amateur competition, and continue to improve Yosemite's winter facilities. The Winter Club members were key proponents in the development of the Badger Pass Ski Area and the ski lodge; today the organization includes hundreds of members who actively support amateur and recreational winter sports in the park.

The Badger Pass Ski Area also hosts many local and regional school groups and other organizations throughout the winter season. Often, the groups are given lessons by volunteer instructors provided by the individual schools, or by the Yosemite Ski and Snowboard School. Equipment and lift tickets are supplied at a reduced rate to these groups.

The Badger Pass Ski Area and the surrounding backcountry provide a wide range of recreational opportunities to park visitors that may enhance their experience. The winter season at the ski area is generally mid-December to late March, conditions permitting. Recreational activities that may take place at or in the vicinity of the project area include cross-country skiing, snowshoeing, downhill skiing, snowboarding, tubing, and guided interpretive tours. According to recent data, some 75-80% of Badger Pass visitors downhill ski, while 10% snow shoe and the remaining 10-15% either cross country ski or utilize tubing runs (Page & Turnbull 2009f). These recreational opportunities are supported by the operation of the ski lodge and are described below.

From the Badger Pass Ski Lodge there are over 90 miles of marked trails and 25 miles of machine-groomed track accessing the surrounding wilderness. Groomed tracks run 10.5 miles to Glacier Point and 1.5 miles to Old Badger Summit. From Glacier Point Road, twelve trails are easily accessed, including destinations to Dewey Point and Ostrander Lake. Backcountry trails and areas are used by both cross-country day travelers and overnight campers. Ski huts at Glacier Point and Ostrander Lake are available for overnight use with reservations.

#### **Downhill Skiing/Snowboarding**

Badger Pass was the first resort in California devoted entirely to skiing. The mountain has ten runs that are mainly beginner and intermediate difficulty, a terrain park, and five lifts. The ski area is geared towards providing a family friendly environment for people to learn to ski or snowboard.

#### **Guided Interpretive Tours**

Daily snowshoe walks led by NPS interpretive rangers are available from the Badger Pass Ski Area. Two-hour and six-hour interpretive tours explore the surrounding area and the route to Dewey Point. Full moon snowshoe walks are among the concessioner interpretive services offered at the ski area.

### **Badger Pass Ski Area**

The Badger Pass Ski Area consists of the Badger Pass Ski Lodge and several associated buildings in the immediate vicinity. Buildings offering related services include an Alpine rental building and a Nordic rental building.

**Badger Pass Ski Lodge:** The Badger Pass Ski Lodge visitor experience includes the following services within the main lodge and the attached west building:

- *Ticketing:* Points of sale for Alpine skiing are located at four locations throughout the area. The current locations are congested, with queue space often conflicting with circulation space.
- *Food and Beverage Service:* There are currently two locations at the ski lodge serving food with approximately 3,000 square feet of seating available. The primary food service area is located on the first floor with counter food service and cafeteria seating. The Snowflake Room is located on the second floor with fast food service, a lounge, and several seating areas. Food and beverage service in the Snowflake Room is used on weekends and peak days only. An additional barbeque area is set up on the 7,076 square foot exterior deck during peak days. At times when the weather is unfavorable there is not enough interior dining/lounge space to accommodate and shelter all skiers on site.
- *Activities Desk:* Operated by the concessioner, the Activities desk provides information regarding current road, snow, weather conditions, messages, and ski area information.
- *Sport Shop:* Accessed by customers and employees from the main-level deck, the 1,460 square feet shop offers ski apparel, accessories, retail food, and gift items. The sport shop also has one dressing room where customers can try on snow apparel.
- *Pups Program and Daycare Center:* The Pups/daycare program provides hourly babysitting and a children's ski program for ages three years and older. Due to lack of storage, ski equipment for the program is exhausted on peak days.
- *Lockers:* A total of 309 full-height lockers and 223 small lockers are provided at five locations throughout the ski lodge. Units are for use by visitors and local skiers with season passes. There are also open storage cubicles provided in the main lounge area.

**Alpine Rental Building and Nordic Rental Building:** Recreational opportunities located in the separate Alpine rental building and Nordic rental building include the following:

- *Ski and Snowboard School:* The Yosemite Ski and Snowboard School was first established in 1928. The school offers learn to ski or snowboard packages and ski lessons. The associated rental shop has equipment for downhill skiing and snowboarding available. As many as 90% of skiers at Badger Pass Ski Area are at the beginner level (Page & Turnbull 2009f). Approximately 65% of skiers buying tickets at the area also rent Alpine equipment (Page & Turnbull 2009d).

The temporary Alpine rental building currently housing the ski and snowboard rentals is approximately 2,865 square feet. On peak use days, long lines at the entry can extend out the door and onto the vehicular drive, flow is congested throughout the building, and rental equipment is exhausted before midday. A short-term solution for peak days has been to move the snowboard equipment outside to a tent to relieve congestion in the building. There is currently no means of egress to the slopes from the Alpine rental building.

- *Cross-country Center and Ski School:* Established in 1970, the Yosemite Cross Country Ski School provides lessons for all ski levels and also leads ski tours and overnight excursions to Glacier Point and the Yosemite backcountry. The 1,200 square foot temporary Nordic rental building provides rentals for cross-country touring, skate, backcountry and telemark skis, snowshoes, snow tubes, and some overnight snowcamping equipment. The current location

lacks signage making finding the building difficult and requires visitors to navigate the vehicular traffic area. During peak days rental equipment is exhausted. The increased popularity of snowshoe hiking has filled the current storage area. The building does not have restrooms available.

## **Environmental Consequences – Methodology**

This analysis evaluates the quality of visitor experiences in terms of how they might be altered as a result of the action alternatives. Professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts.

Analysis was based on whether there was a complete loss of a recreation opportunity, a change in access to or availability of a recreation opportunity, a change in the quality of visitor experience, or recreational opportunities or a change in safety.

**Duration:** In terms of duration, short-term construction-related impacts on the visitor experience are not applicable to this topic. All construction would be phased for the summer season and would not affect the ski facility or adjacent activities during the winter season. Long-term impacts would have a permanent effect on the visitor experience.

**Intensity:** In terms of intensity, impacts are defined as negligible, minor, moderate, and major. Negligible impacts are effects considered not detectable and would result in little noticeable change in visitor experience. Minor impacts would result in changes in desired experiences, but without appreciably limiting or enhancing the overall effect. Moderate impacts would be clearly detectable and could change the desired experience appreciably. Major impacts would eliminate or greatly enhance characteristics creating a substantial, highly noticeable influence.

**Type of Impact:** In terms of type, impacts were evaluated in terms of whether they would be beneficial or adverse to visitor participation, quality of visitor experience, and service level.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

Under the No Action Alternative, the Badger Pass Ski Area and associated activities would remain in their existing condition. Recreational activities, including cross-country skiing, snowshoeing, downhill skiing, snowboarding, and guided interpretive tours would continue. Winter Club members, local and regional schools, other organizations, and the general public would continue to have access to the Badger Pass Ski Area. The Badger Pass Ski Area would continue to include the Badger Pass Ski Lodge, the temporary Alpine rental building and the temporary Nordic rental building at the same capacity and function.

Impacts on visitor experience at the ski lodge would continue to include insufficient dining, seating, and restroom facilities during peak use times and interior seating that is insufficient during unfavorable weather. Crowding and inconvenient pedestrian circulation at several areas including the entryway, the Activities desk, at ticketing in the breezeway, and at the ground floor exit to the slopes would continue. Access to the second floor and ground floor within the main lodge would remain restricted for disabled visitors.

Nordic and Alpine rentals would remain available in temporary buildings. On peak use days these facilities would remain inadequate in size for visitor demand, with equipment inventories exhausted by midday. There would continue to be no restroom facilities in the Nordic rental

building and no means of egress to the slopes from the Alpine rental building. The continued lack of way finding would make locating the Nordic rental building difficult.

**Conclusion:** Under Alternative 1, continued poor circulation and wayfinding, crowding at several locations, insufficient facilities, inadequate accessibility for disabled persons, and lack of rental inventory/space would have a local, long-term, minor to moderate, adverse impact on the visitor winter experience within the project area.

### **Cumulative Impacts**

Past actions in the project area that cumulatively impact visitor experience include replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, and relocation of the Alpine rental shop. Nearby past actions with the potential to affect visitor experience include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing and the Tunnel View Overlook rehabilitation. Recently completed improvements in the ski area parking lot as part of the Glacier Point Road Rehabilitation Project included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Present actions that cumulatively impact visitor experience include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would occur during the summer with short-term adverse impacts due to traffic delays and rerouting during the construction; no short-term effects are expected from other listed projects. In the long-term, these projects would benefit visitor experience by improving park infrastructure, improving safety, reducing traffic pressures on Wawona Road, continuing access for Alpine skiers to Badger Pass ski slopes and improved interpretive displays.

Reasonably foreseeable future actions that would cumulatively impact visitor experience within the project area include the Scenic Vista Management Plan, which would have a beneficial effect on visitor experience by maintaining and restoring the historic views and vistas of Yosemite. The cumulative actions in combination with Alternative 1 would result in local, long-term, minor, beneficial impact on visitor experience.

## **Environmental Consequences of Alternative 2**

### **Analysis**

Visitor experience at the Badger Pass Ski Area would be improved by addressing user safety, comfort and accessibility. Where new construction occurs, the work would be designed to provide optimal functionality and service.

There are a number of actions common to all action alternatives that would impact visitor experience at the Badger Pass Ski Lodge and associated buildings. These actions are included as Phase 1 in each of the alternatives. The impacts of Phase 1 are discussed in the following analysis. Impacts specific to an individual alternative are addressed in the subsequent analyses for each action alternative.

With implementation of Alternative 2, the existing activities available at the ski area would remain. The ski lodge facilities would continue to consist of the Badger Pass Ski Lodge, an Alpine rental building, and a Nordic rental building. Alternative 2 would retain the current visitor arrival and

circulation organization through the ski lodge, however, improvements would be made to provide accessible paths of travel to program areas.

There are a number of actions common to all action alternatives that would impact visitor experience at the Badger Pass Ski Lodge and associated buildings. All required code upgrades, including accessibility, would be completed as part of Phase 1 in each action alternative. Major repairs and replacement of systems at the main lodge and west building that would directly affect visitor experience include improvements to the exterior decking and architectural window walls; the construction of an accessible ticket kiosk and platform at the breezeway; removal and replacement of the heated entry concrete walkway; providing construction of a new, accessible curb cut; installation of a three stop elevator in the main lodge with connection lobby and corridors; addition of accessible restrooms at ground, first, and second floors of the main lodge; and, replacement of floors at the ground level to provide a continuously accessible level. Phase 1 would not include changes to the Nordic rental building, however, there would be fire protection upgrades for the temporary Alpine rental building.

Phase 1 construction would occur during an off season (summer) construction schedule. It is a goal of this project to phase the project in such a way as to maintain a fully functional and accessible facility during the winter season.

Subsequent work under all action alternatives would be focused on replacement of the temporary Alpine and Nordic rental buildings with permanent buildings that include restrooms. Improvements to the crowding and pedestrian circulation would occur at the ski lodge entryway, the Activities desk, as feasible and appropriate. Under Alternative 2 an accessible ramp would be provided in the breezeway.

Under Alternative 2, adverse impacts on visitor experience at the ski lodge would continue to include insufficient dining, seating and restroom facilities during peak times and interior seating that is insufficient during unfavorable weather.

**Conclusion:** All of the action alternatives would result in improved accessibility and visitor safety at the ski lodge, the uninterrupted of use the facility by ski area visitors (as construction would occur during the summer season), and the replacement of temporary Alpine and Nordic rental facilities with new and more efficient buildings. Under Alternative 2, there would also be minor improvements to crowding and circulation issues, resulting in a local, long-term, minor, beneficial impact on the visitor experience at Badger Pass Ski Area.

### **Cumulative Impacts**

Past actions in the project area that cumulatively impact visitor experience include replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, and relocation of the Alpine rental shop. Nearby past actions with the potential to affect visitor experience include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing and the Tunnel View Overlook rehabilitation. Recently completed improvements in the ski area parking lot as part of the Glacier Point Road Rehabilitation Project included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Present actions that cumulatively impact visitor experience include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road

rehabilitation actions would occur during the summer with short-term adverse impacts due to traffic delays and rerouting during the construction; no short-term effects are expected from other listed projects. In the long-term, these projects would benefit visitor experience by improving park infrastructure, improving safety, reducing traffic pressures on Wawona Road, continuing access for Alpine skiers to Badger Pass ski slopes and improved interpretive displays.

Reasonably foreseeable future actions that would cumulatively impact visitor experience within the project area include the Scenic Vista Management Plan, which would have a beneficial effect on visitor experience by maintaining and restoring the historic views and vistas of Yosemite.

The cumulative actions in combination with Alternative 2 would result in local, long-term, minor, beneficial impact on visitor experience.

### **Environmental Consequences of Alternative 3**

#### **Analysis**

In addition to the improvements made under all action alternatives as described under Alternative 2, above, full implementation of Alternative 3 would make improvements to visitor circulation, functional needs, and the sense of arrival at the Badger Pass Ski Lodge. This alternative includes improved spatial relationships, redirected circulation in gathering and dining areas, enhancement of site view corridors, and reorganization of program uses to better accommodate functional needs.

Work in Alternative 3 provides key improvements to visitor circulation with the reconfiguration and relocation of some program elements within the ski lodge. Improvements to food and beverage points of service would be made, and an extended indoor dining area and second floor dining would be made open to the lounge area. In addition, the fireplace and historic lounge character would be restored at the main lodge.

**Conclusion:** All of the action alternatives would result in improved accessibility and visitor safety at the ski lodge, the uninterrupted use of the facility by ski area visitors (as construction would occur during the summer season), and the replacement of temporary Alpine and Nordic rental facilities with new and more efficient buildings. Implementation of Alternative 3 would result in substantial improvements to circulation, a reduction in crowding at key locations, restoration of the historic lounge character, and improvements to food and dining services, resulting in a local, long-term, minor to moderate, beneficial impact on the visitor experience at Badger Pass Ski Area.

#### **Cumulative Impacts**

Past actions in the project area that cumulatively impact visitor experience include replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, and relocation of the Alpine rental shop. Nearby past actions with the potential to affect visitor experience include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing and the Tunnel View Overlook rehabilitation. Recently completed improvements in the ski area parking lot as part of the Glacier Point Road Rehabilitation Project included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Present actions that cumulatively impact visitor experience include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road

rehabilitation actions would occur during the summer with short-term adverse impacts due to traffic delays and rerouting during the construction; no short-term effects are expected from other listed projects. In the long-term, these projects would benefit visitor experience by improving park infrastructure, improving safety, reducing traffic pressures on Wawona Road, continuing access for Alpine skiers to Badger Pass ski slopes and improved interpretive displays.

Reasonably foreseeable future actions that would cumulatively impact visitor experience within the project area include the Scenic Vista Management Plan, which would have a beneficial effect on visitor experience by maintaining and restoring the historic views and vistas of Yosemite.

The cumulative actions in combination with Alternative 3 would result in local, long-term, minor to moderate, beneficial impact on visitor experience.

## **Environmental Consequences of Alternative 4**

### **Analysis**

In addition to the improvements made under all action alternatives, as described under Alternative 2, above, Alternative 4 would group visitor program areas into zones that would enable clear wayfinding through the site, provide well-defined entry and exit points, and create a logical circulation path. The programs themselves would be reconfigured to provide the most efficient and effective arrangements for their specific role at the lodge.

Implementation of Alternative 4 would provide substantial improvements to food and dining services, provide an additional elevator in the west building, and would result in the addition of restrooms throughout the facility. The design of this alternative, with open areas between buildings, would greatly improve public circulation at the ski lodge. The fireplace and historic lounge character would be restored at the main lodge, and important spatial relationships and site view corridors would be enhanced throughout the site.

**Conclusion:** All of the action alternatives would result in improved accessibility and visitor safety at the ski lodge, the uninterrupted use of the facility by ski area visitors (as construction would occur during the summer season), and the replacement of temporary Alpine and Nordic rental facilities with new and more efficient buildings. Under Alternative 4, the configuration of program and visitor services would be at their most optimal location, given overall site constraints of the project. There would be substantial improvements to circulation, and to food and dining services, and restoration of the historic lounge character, resulting in a local, long-term, moderate, beneficial impact on the visitor experience at Badger Pass Ski Area.

### **Cumulative Impacts**

Past actions in the project area that cumulatively impact visitor experience include replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, and relocation of the Alpine rental shop. Nearby past actions with the potential to affect visitor experience include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing and the Tunnel View Overlook rehabilitation. Recently completed improvements in the ski area parking lot as part of the Glacier Point Road Rehabilitation Project included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Present actions that cumulatively impact visitor experience include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would occur during the summer with short-term adverse impacts due to traffic delays and rerouting during the construction; no short-term effects are expected from other listed projects. In the long-term, these projects would benefit visitor experience by improving park infrastructure, improving safety, reducing traffic pressures on Wawona Road, continuing access for Alpine skiers to Badger Pass ski slopes and improved interpretive displays.

Reasonably foreseeable future actions that would cumulatively impact visitor experience within the project area include the Scenic Vista Management Plan, which would have a beneficial effect on visitor experience by maintaining and restoring the historic views and vistas of Yosemite. The cumulative actions in combination with Alternative 4 would result in local, long-term, moderate, beneficial impact on visitor experience.

## **Visitor Services**

### **Affected Environment**

#### **Badger Pass Ski Area**

The Badger Pass Ski Area consists of the Badger Pass Ski Lodge and several associated buildings in the immediate vicinity. Buildings offering services addressed in this rehabilitation plan include the Badger Pass Ski Lodge, the Alpine rental building, and the Nordic rental building.

**Badger Pass Ski Lodge:** The Badger Pass Ski Lodge offers the following services located within the main lodge, breezeway, and attached west building:

- *Ticketing:* Points of sale for lift tickets, ski rental, ski school, and tubing are located at four locations. Stations are often not adequate for handling volume of visitors and long lines often form at peak times, slowing service.
- *Ski School:* Different functions including equipment storage, meeting areas etc., are located in several locations throughout the main lodge.
- *Food and Beverage Service:* There are currently two locations at the main lodge serving food. The primary food service area is located on the first floor of the Badger Pass Ski Lodge with counter food service and cafeteria seating. The Snowflake Room is located on the second floor with fast food service, a lounge, and several seating areas. The Snowflake Room is used on weekends and peak days only. An additional barbeque area is set up exterior deck during peak days. Kitchen facilities lack adequate space for dry and cold food storage on peak days. As a result, food is brought up from Yosemite Valley daily. One walk-in freezer is located outside, on cold wet days the door freezes closed and operation becomes difficult. The service entrance is co-located near the bus drop off and accessible parking area on the north side of the lodge, causing congestion. The dishwashing area is not on the same level as the kitchen causing safety issues with employees. The current recycling program does not have adequate storage. Waste and trash storage is inadequate.
- *Activities Desk:* The Activities desk provides information regarding current road, snow, weather conditions, messages, and ski area information. The Activities desk is located near the Pups program, allowing staff to move back and forth between areas as needed. There are two points of sale locations at the Activities desk.
- *Sport Shop:* The retail space is of adequate space, and offers ski apparel, accessories, snacks and gift items. Storage space is limited.

- *Pups Program and Daycare Center:* The Pups program/daycare provides hourly babysitting and a kids ski program for children three years and older. Due to lack of storage, ski equipment for the program is exhausted on peak days. There are two points of sale at the Pups program desk.
- *Lockers:* A total of 309 full-height lockers and 223 half-size lockers are provided at five locations throughout the main building. There are open storage cubicles in the main lounge area.

***Alpine Rental Building and Nordic Rental Building:*** Additional visitor services are provided in the separate Alpine rental building and Nordic rental building:

- *Alpine Rental Building:* The building housing the ski and snowboard rentals is approximately 2,865 square feet. The current layout restricts flow, and congestion throughout the building restricts the ability of technicians to assist visitors. A short term solution for peak days has been to move the snowboard equipment outside to a tent to relieve congestion in the building. Due to lack of storage, on peak days rental equipment is exhausted before midday.
- *Nordic Rental Building:* The 1,200 square foot building provides rentals for cross-country touring, skate, backcountry and telemark skis, tubing, snowshoes and some overnight snowcamping equipment. Due to lack of storage, during peak days rental equipment is exhausted.

## **Environmental Consequences – Methodology**

This analysis evaluates visitor services in terms of how they might be altered as a result of the Action Alternatives. Analysis was based on whether there was a loss, gain or change in the efficiency of a visitor service or a change in safety. Professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts.

**Duration:** In terms of duration, short-term construction-related impacts on visitor services are not applicable to this topic. All construction would be phased for the summer season and would not affect the ski facility during the winter season. Long-term impacts would have a permanent effect on visitor services.

**Intensity:** In terms of intensity, impacts are defined as negligible, minor, moderate, and major. Negligible impacts are effects considered not detectable and would result in little noticeable change to visitor services. Minor impacts would result in changes to services, but are not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect on services. Major impacts would eliminate or greatly enhance characteristics creating a substantial, highly noticeable influence.

**Type of Impact:** In terms of type, impacts were evaluated in terms of whether they would be beneficial or adverse to visitor service functions.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

There would be no long-term changes to visitor services under Alternative 1.

There is no clear path of travel between the various visitor services at the ski lodge complex, and circulation areas would remain crowded and inconvenient at peak times. The dispersed location of the ticketing stations would continue to cause bottlenecks at the main lodge entryway, at the Activities desk, at ticketing in the breezeway, and at the ground floor exit to the slopes.

Kitchen facilities would continue to lack adequate space for dry and cold food storage; food would continue to be trucked from Yosemite Valley daily. A walk-in freezer would remain located outside with limited functionality. The kitchen service entrance would continue to cause congestion with deliveries. The dishwashing area would remain on a different level than the kitchen, resulting in employee safety issues. The recycling program as well as the waste and trash storage would continue to have inadequate storage.

Due to lack of storage, on peak days rental equipment for the Alpine and Nordic rental buildings and the Pups program would continue to be exhausted.

The layout of the Alpine rental building would continue to restrict flow, with the congestion throughout the building restricting the ability of technicians to assist visitors. Moving the snowboard equipment outside would continue on peak days. Storage space at the retail shop would remain limited.

**Conclusion:** Under Alternative 1, the lack of a clear path of travel between various visitor services in the lodge, the inefficient layout of rental areas, inadequate storage space, and limited kitchen work areas and associated facilities would continue to have a local, long-term, minor, adverse impact on visitor services.

### **Cumulative Impacts**

Past actions that cumulatively impact visitor services in the project area include the development, modification, and expansion of the ski area, replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, relocation of the Alpine rental shop, ground floor food service remodel, ski area terrain park relocation, Snowflake Room food service reactivation, and temporary modular rental shop installation. Nearby past actions with the potential to affect visitor services include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing, and restoration of rest stop structures at Chinquapin.

Present actions that cumulatively impact visitor services include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would have short-term adverse impacts due to traffic delays and rerouting during construction; no short-term effects are expected from other listed projects. In the long-term, these projects would benefit visitor services by improving park infrastructure, improving safety, and continuing access to Badger Pass Ski Area.

The cumulative actions in combination with Alternative 1 would result in local, long-term, minor, beneficial impact on visitor services.

## **Environmental Consequences of Alternative 2**

### **Analysis**

Implementation of Alternative 2 would result in reconstruction or rehabilitation of the existing building envelope. As under all action alternatives, critical repairs and code upgrades would occur but under Alternative 2 there would be minimal changes to visitor services within the ski lodge structure. The two temporary Alpine and Nordic rental buildings would be replaced with buildings of approximately the same size but with improved layout, storage, and restrooms. The layout of the

Alpine and Nordic rental buildings would be improved, allowing technicians a more efficient environment to assist visitors in fitting equipment.

Under Alternative 2, there would be improvements to provide accessible paths of travel to visitor services at the west building and main lodge. As under all action alternatives, an accessible path of travel would be provided between the new Nordic Center and the ski lodge.

Deliveries would continue to be unloaded adjacent to the bus loading and handicap parking areas. Kitchen facilities would continue to lack adequate space for dry and cold food storage, and food would continue to be delivered from Yosemite Valley. The dishwashing area would remain on a different level than the kitchen. The current recycling program as well as the waste and trash storage would continue to have inadequate storage.

Storage space at the retail shop would remain limited. Lack of storage for ski equipment for the Pups program would continue to cause equipment to be exhausted on peak days.

**Conclusion:** Implementation of Alternative 2 would result in essential repairs and code upgrades, minor improvements to circulation between visitor services, more adequate storage space, more efficiently designed equipment rental facilities, new restrooms, and upgrades to the kitchen work area. Elements to improve overall visitor safety would also be implemented. However, some facilities such as the kitchen would continue to be inadequate, resulting in a local, long-term, negligible, beneficial impact on visitor services, when compared with Alternative 1.

### **Cumulative Impacts**

Past actions that cumulatively impact visitor services in the project area include the development, modification, and expansion of the ski area, replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, relocation of the Alpine rental shop, ground floor food service remodel, ski area terrain park relocation, Snowflake Room food service reactivation, and temporary modular rental shop installation. Nearby past actions with the potential to affect visitor services include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing, and restoration of rest stop structures at Chinquapin.

Present actions that cumulatively impact visitor services include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would have short-term adverse impacts due to traffic delays and rerouting during construction; no short term effects are expected from other listed projects. In the long-term, these projects would benefit visitor services by improving park infrastructure, improving safety, and continuing access to Badger Pass Ski Area.

The cumulative actions in combination with Alternative 2 would result in local, long-term, minor, beneficial impact on visitor services.

## **Environmental Consequences of Alternative 3**

### **Analysis**

In addition to the improvements implemented in Alternative 2, Alternative 3 would include several key improvements to the location and efficiency of visitor services. Points of sale would be relocated and consolidated at the entrance of the main lodge. The Pups program/daycare and

office areas would be relocated to the west building with a separate entry from the public plaza. There would be improvements to food and beverage points of service, extended indoor dining, a café food service at the west building adjacent to the retail operation, and new restrooms in the main lodge, Alpine rental building, and Nordic Center.

Kitchen facilities would be improved but would continue to lack adequate space for sufficient dry and cold food storage; some pre-prepared food would continue to be delivered from Yosemite Valley. The dishwashing area would be moved to the same level as the kitchen, alleviating safety issues. The recycling, waste and trash program would have an improved storage system. The delivery area would remain adjacent to the kitchen; deliveries would continue to be unloaded adjacent to the bus loading and accessible parking areas.

The layout of the Alpine and Nordic rental facilities would be improved, allowing technicians a more efficient environment to assist visitors in fitting equipment.

Facilities for overnight staff would be improved with adequate space and rest rooms. Employee break areas, office space, a meeting room and storage space would be provided.

**Conclusion:** In addition to the improvements implemented under Alternative 2, Alternative 3 would result in key improvements to the location and efficiency of visitor services at the ski lodge, improved storage space areas, new employee break areas and expanded facilities for overnight staff, and upgrades to kitchen work areas and related facilities. This alternative would result in a local, long-term, minor, beneficial impact on visitor services.

### **Cumulative Impacts**

Past actions that cumulatively impact visitor services in the project area include the development, modification, and expansion of the ski area, replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, relocation of the Alpine rental shop, ground floor food service remodel, ski area terrain park relocation, Snowflake Room food service reactivation, and temporary modular rental shop installation. Nearby past actions with the potential to affect visitor services include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing, and restoration of rest stop structures at Chinquapin.

Present actions that cumulatively impact visitor services include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would have short-term adverse impacts due to traffic delays and rerouting during construction; no short term effects are expected from other listed projects. In the long-term, these projects would benefit visitor services by improving park infrastructure, improving safety, and continuing access to Badger Pass Ski Area.

The cumulative actions in combination with Alternative 3 would result in local, long-term, minor, beneficial impact on visitor services.

## **Environmental Consequences of Alternative 4**

### **Analysis**

In addition to the improvements implemented in Alternative 2, Alternative 4 would involve physical alterations to all portions of the facility. Temporary buildings and large non-contributing

additions to the ski lodge would be removed and replaced with free-standing additions. Reprogramming of available space would be designed to provide optimal efficiency.

Several benefits to the level of visitor service would be provided in Alternative 4. Visitor programs would be relocated and related uses grouped together. The program spaces would be reconfigured to maximize the efficient use of their space. Entry and exit locations would be well-defined, and circulation within the lodge and between lodge facilities would be greatly improved.

The new west building would house kitchen facilities, with expanded dry and cold food storage facilities opportunities. A walk-in freezer would be re-located, improving functionality. Dishwashing facilities would be relocated, improving safety concerns with employees. The recycling, waste and trash program would have an improved storage system. A delivery area for the kitchen would be provided along the north side of the lodge.

As under Alternatives 2 and 3, the layout of the new Alpine rental building and Nordic Center would be improved, allowing technicians a more efficient environment to assist visitors in fitting equipment. Overnight staff facilities would be improved with adequate space and restrooms. Employee break areas, office space, a meeting room, and storage space would be provided.

**Conclusion:** Implementation of Alternative 4 would result in the most improvements to the location and efficiency of visitor services, storage space, employee facilities, and upgrades to all kitchen work areas. Elements to improve overall visitor safety would also be implemented. Implementation of this alternative would result in a local, long-term, minor to moderate, beneficial impact on visitor services.

### **Cumulative Impacts**

Past actions that cumulatively impact visitor services in the project area include the development, modification, and expansion of the ski area, replacement of the Eagle, Bruin, and Badger ski lifts, ski lodge stabilization measures and deck repairs, relocation of the Alpine rental shop, ground floor food service remodel, ski area terrain park relocation, Snowflake Room food service reactivation, and temporary modular rental shop installation. Nearby past actions with the potential to affect visitor services include restoration of rest stop structures at Chinquapin, Bridalveil Creek Campground road resurfacing, and restoration of rest stop structures at Chinquapin.

Present actions that cumulatively impact visitor services include the Glacier Point Road rehabilitation, Wawona Road rehabilitation, and the interpretive displays project. The road rehabilitation actions would have short-term adverse impacts due to traffic delays and rerouting during construction; no short term effects are expected from other listed projects. In the long-term, these projects would benefit visitor services by improving park infrastructure, improving safety, and continuing access to Badger Pass Ski Area.

The cumulative actions in combination with Alternative 4 would result in local, long-term, minor to moderate, beneficial impact on visitor services.

## **Facility Operations and Infrastructure**

### **Affected Environment**

The Badger Pass Ski Lodge is the center of ski operations in Yosemite during the winter season from December through March. For the summer months of June to August, the building is used as a base camp for Yosemite National Park's Youth Conservation Corps (YCC).

### **Operations**

Throughout the winter season the Badger Pass Ski Area is a concessioner-operated, full service ski facility with approximately 145 employees providing visitors with services necessary for downhill and cross-country activities. Operations at the Badger Pass Ski Area can be categorized as either National Park Service or concessioner functions. In general, the National Park Service is responsible for maintaining the infrastructure outside the building (i.e., water lines, water storage, wastewater disposal, electrical service, roads, and parking lots), and providing visitor protection and interpretive services. The concessioner is responsible for maintaining the exterior and interior of the building, interior mechanical, electrical and plumbing systems, removing solid waste, providing first aid services, and operating the facility for use by the public as a ski resort.

The NPS Divisions of Visitor Protection, Interpretation and Education, and Facility Management maintain a physical or operational presence at the Badger Pass Ski Area during the ski season. The Division of Visitor Protection and the Division of Interpretation and Education are based out of the Badger Pass Ranger Station, a small A-frame building in close proximity to the lodge. The ranger station has a public area used by interpretive rangers to disseminate park information, answer visitor questions, and issue wilderness permits. NPS law enforcement rangers perform essential functions and responsibilities including law enforcement and resource protection, search and rescue, emergency medical response, wilderness management, and oversight of winter operation activities at the Badger Pass Ski Area and along the Glacier Point Road corridor.

The NPS Division of Facilities Management performs preventive and corrective maintenance on utility infrastructure throughout the Badger Pass Ski Area, which includes the water supply system, and the wastewater disposal infrastructure. The National Park Service also maintains the roads and parking lot and several of the buildings located throughout the site.

Pacific Gas & Electric (PG&E) is responsible for the electrical system between El Portal and Chinquapin, and from Chinquapin to the transformer and meter at Badger Pass Ski Area. The NPS Division of Facilities Maintenance is responsible for maintenance of the electrical system from the meter to the ski lodge. The concessioner is responsible for the electrical system within the building.

The concessioner is generally responsible for maintaining the Badger Pass Ski Lodge and associated equipment rental buildings. Building maintenance includes seasonal repairs due to water damage, painting, roofing, deck repairs, temporary drainage remedies, flooring replacement, and the mechanical, electrical, and plumbing systems inside the ski lodge. Mechanical and electrical systems throughout the building are obsolete and need to be repaired, upgraded, or replaced. Most plumbing and heating systems are outdated and have exceeded their expected service lifetimes. In addition, the utility infrastructure for water production, storage, and treatment, and wastewater conveyance to the onsite wastewater treatment system is in need of repair or replacement to improve efficiency and restore integrity.

The concessioner also provides for snow removal around the ski lodge, snow grooming, skiing lessons, lift ticket sales, a retail sports shop, food service areas, an activities desk, a Pups (children's) program and daycare center, several washroom facilities, two rental sports shops: one for downhill skiing and snowboarding and one to service cross-country skiing, tubing, and snowshoeing; guided tours, lift operation, and grooming of the slopes.

Snow removal and grooming activities are supported by overnight staff at the ski area. Due to safety concerns with inclement weather and frequent weather-related closures on the Glacier Point Road, nighttime staff are given the option remain at the lodge overnight in a bunkroom located above the kitchen. The bunkroom includes a sleeping area for four staff, two storage closets, and a full bathroom. Currently, there is inadequate bunkhouse accommodation for all overnight staff and the bunkhouse is not ADA-accessible. There are no designated employee break rooms at the ski lodge.

Offices are located on the second floor of the west building, including an auditor's workspace, bank drop/safe, two workstations, a restroom, and storage. Attached to these administrative spaces is a large office that is shared by the ski area manager and assistant manager. An office located on the first floor of the west building is used for ski school administrative services and lesson scheduling. Ski patrol facilities consist of a staff locker room on the ground floor of the west building near the west exit of locker room C. Lift operations are housed in a room below the breezeway on the ground floor. Additionally, two administrative offices and a work room are located at the southwest corner of the original lodge building, adjacent to the Activities desk.

The ski area operator's offices and front desk administrative space are located in an addition to the lodge on the ground floor. A room on the ground floor of the west building, north of locker room A, is used as a locker room for ski school instructors. The Rusty Rust Room, adjacent to locker room B, is used for ski race storage and equipment.

Kitchen facilities on the first floor of the main lodge include: kitchen space, a hot prep area, a finishing area, two walk-in freezers (one accessed from outside the building, which is problematic when the door freezes over), storage space, and a dishwashing area. Additionally, a barbeque is set up on the exterior deck on peak days only. Food, waste, and recycling storage facilities are insufficient, and the kitchen layout is inefficient. Increased frequency of deliveries from Yosemite Valley is sometimes required due to a lack of cold storage. Deliveries are unloaded on the north side of the lodge adjacent to the bus loading, pedestrian entry, and ADA-accessible parking areas.

During the summer season the lodge is used as a base camp for approximately 40 YCC members and 25 NPS staff supporting the YCC program. The area is not open to the general public during this time.

### **Life Safety Issues**

Life safety systems at the ski lodge are not fully compliant with current codes. In particular, emergency egress, separations, signage, and fire detection systems are insufficient, and the automatic fire suppression sprinkler system in the lodge is in need of upgrades or replacement (Page & Turnbull 2009f). No sprinkler system is in place in the Nordic building. There is no dedicated water supply for fire protection.

The concessioner is responsible for maintaining the sprinkler and alarm systems within the building. In the case of an alarm, both concessioner security and the National Park Service would respond.

### **Hazardous Materials**

Early coats of paint on the buildings at Badger Pass, including the Badger Pass Ski Lodge, likely contain lead. Asbestos remediation in the 1980s and 1990s resulted in the removal of the majority of asbestos at the ski lodge; however, some asbestos is likely still present encased around piping (DNC 2009).

## **Environmental Consequences – Methodology**

This analysis evaluates operation and infrastructure in terms of how they might be altered as a result of the no-action and action alternatives. Analysis was based on whether there was a loss, gain or change in the efficiency of operations or infrastructure or a change in safety. Professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts

**Duration:** In terms of duration, short-term construction-related impacts on operations are only applicable to the YCC program at Badger Pass. All construction would be phased for the summer season and would not affect the ski facility during the winter season. Long-term impacts would have a permanent impact on operations or infrastructure.

**Intensity:** The intensities of impacts consider whether the impact would be negligible, minor, moderate, or major. Negligible impacts are effects considered not detectable and would have no discernible effect operations or infrastructure. Minor impacts are effects on operations or infrastructure that would be slightly detectable, but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect on operations or infrastructure. Major impacts would have a substantial, highly noticeable influence on operations or infrastructure and could permanently alter those conditions.

**Type of Impact:** Impacts would be considered either beneficial or adverse. Beneficial impacts would represent a change that would improve operations or infrastructure. Adverse impacts would negatively alter operations or infrastructure.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

**Construction-related impacts:** There would be no construction-related impacts on operations under the no-action alternative.

**Long-term impacts:** There would be no long-term changes to operations under the no-action alternative.

Badger Pass Ski Area would remain a concessioner-operated facility throughout the year, providing visitors with services necessary for downhill and cross-country ski activities in the winter season. Seasonal repairs to the ski lodge would continue, including ongoing temporary patching and repairs due to water damage throughout much of the structure, extensive painting, and ongoing roofing and deck repairs, temporary drainage remedies, piecemeal flooring replacement, and

continuous repairs to the outdated mechanical, electrical, and plumbing systems inside the ski lodge.

The NPS Division of Facilities Management would continue to perform preventive and corrective maintenance on infrastructure throughout the Badger Pass Ski Area. Likewise, the concessioner would continue to perform its maintenance requirements as specified under the concession contract, including extensive snow management operations.

There would be no change to the summer use of the ski lodge as a base camp for YCC members and associated NPS staff.

**Conclusion:** Under Alternative 1, ongoing maintenance performed by the concessioner, including snow management requirements, would continue and be extensive. The layout of staff accommodations and work areas would continue to be inefficient and insufficient to support visitor services. The overall condition of the building would continue to slowly deteriorate, resulting in further maintenance and component repairs requirements. Alternative 1 would result in a local, long-term, moderate, adverse impact on operations.

### **Cumulative Impacts**

Past actions that have impacted operations within the project area include replacement of the Badger, Bruin, and Eagle ski lifts, life/safety shoring of the main lodge decking, remodel of the ground floor food service, lower and upper deck repairs, Alpine rental shop demolition and temporary modular shop installation, ski lodge emergency stabilization measures, and recently completed improvements to the ski area parking lot associated with the Glacier Point Road Rehabilitation Project. Ski lift projects have reduced associated maintenance. Stabilization projects have prolonged the use of the facility with no reduction in operational requirements, and installation of the temporary Alpine rental building has resulted in greater snow removal requirements. Recently completed improvements in the ski area parking lot included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Reasonable foreseeable actions include possible construction of the Yosemite Environmental Education Center at Henness Ridge, which could involve upgrades to existing power supply that services the Badger Pass Ski Area, and interim roof repairs.

The cumulative actions in combination with Alternative 1 are expected to result in a local, long-term, minor, adverse impact on operations.

## **Environmental Consequences of Alternative 2**

There are a number of actions common to all action alternatives that would impact operation and maintenance requirements at the Badger Pass Ski Area. As described in Chapter 2, the actions common to all action alternatives include all required code upgrades for life-safety, fire protection, accessibility and building infrastructure. Upgrades to civil, structural, mechanical, plumbing and electrical systems would be completed. Major repairs and replacement at the main lodge and west building, including exterior decking, roofing, steel framing and architectural window walls would be completed as part of Phase 1 in all action alternatives. Replacement of the temporary Alpine and Nordic rental buildings with permanent structures would also occur in all action alternatives.

## Analysis

**Construction-related impacts:** Due to the seasonal phasing of this project, NPS and concessioner ski area operations are not expected to be impacted by project implementation. Proposed utility and site drainage improvements would impose an additional short-term, minor, adverse impact on the National Park Service due to the increased cost associated with staff time on construction monitoring and oversight.

Site assessments have established that some buildings and soil under the buildings may contain asbestos and /or lead paint. Standard mitigation measures included as part of project construction (see Appendix B) would reduce the magnitude of the impact to short-term, negligible and adverse.

Short-term, minor adverse impacts are expected for the YCC program currently using the Badger Pass Ski Lodge as a base camp. The program would move to a suitable location for the two seasons during which reconstruction activities are expected. In the long-term there would be a moderate, beneficial impact for the YCC program due to structural, code, and life-safety improvements at the lodge.

**Long-term impacts:** Under Alternative 2, Badger Pass Ski Area would remain a concessioner-operated facility throughout the year, providing visitors with services necessary for downhill and cross-country ski activities in the winter season. Services provided by the National Park Service and the concessioner would not change.

Implementation of Alternative 2 would include a comprehensive rehabilitation within the existing envelope of the Badger Pass Ski Lodge, resulting in a reduction in the extensive seasonal repairs required of the concessioner. Annual repairs due to water damage, ongoing roofing and deck repairs, piecemeal flooring replacement, and continuous repairs to the outdated mechanical, electrical and plumbing systems inside the Badger Pass Ski Lodge would be greatly reduced. Snow removal around the ski lodge would be facilitated with the installation of automated snowmelt systems. Overall, this would result in a local, long-term, minor to moderate, beneficial impact on concessioner operations.

Under all action alternatives, the installation of a fire detection and alarm system throughout Badger Pass Ski Lodge, replacement of the existing automatic sprinkler system, and code conforming infrastructure, including a dedicated on-site fire protection water supply and fire pump, would have a long-term, moderate, beneficial impact on life safety systems and operations at the ski lodge.

The NPS Divisions of Visitor Protection and Interpretation and Education would maintain a physical or operational presence at the Badger Pass Ski Area. Under all action alternatives, NPS interpretive functions would be moved to the west building. The new interpretive desk would have a beneficial impact on operations as it would provide additional, adequate space for existing functions. The NPS Division of Facilities Management would continue to perform preventive and corrective maintenance on infrastructure throughout the Badger Pass Ski Area. Proposed utility and site drainage improvements would result an additional long-term, minor, adverse impacts on the National Park Service due to the increased cost associated with maintenance of additional infrastructure. Overall, there would be a long-term, negligible, adverse effect on NPS operations.

**Conclusion:** Implementation of Alternative 2 would result in long-term, minor to moderate beneficial impact on concessioner operations due to a substantial reduction in annual maintenance

requirements. There would be long-term, minor, beneficial impact on NPS operations from the relocation of interpretive functions to the west building; however, there would also be short-term and long-term negligible to minor adverse impacts on NPS operations due to increased cost associated with construction oversight and maintenance of new utility and site drainage infrastructure.

### **Cumulative Impacts**

Past actions that have impacted operations within the project area include replacement of the Badger, Bruin, and Eagle ski lifts, life/safety shoring of the main lodge decking, remodel of the ground floor food service, lower and upper deck repairs, Alpine rental shop demolition and temporary modular shop installation, ski lodge emergency stabilization measures, and recently completed improvements to the ski area parking lot associated with the Glacier Point Road Rehabilitation Project. Ski lift projects have reduced associated maintenance. Stabilization projects have prolonged the use of the facility with no reduction in operational requirements, and installation of the temporary Alpine rental building has resulted in greater snow removal requirements. Recently completed improvements in the ski area parking lot included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Reasonable foreseeable actions include possible construction of the Yosemite Environmental Education Center at Henness Ridge which could involve upgrades to existing power supply that services the Badger Pass Ski Area, and interim roof repairs.

The cumulative actions in combination with Alternative 2 are expected to result in a local, long-term, negligible, beneficial impact on operations.

### **Environmental Consequences of Alternatives 3 and 4**

Alternatives 3 and 4 would have similar impacts on operations and thus they are analyzed jointly. Differences between alternatives are discussed where they are relevant to operations.

In addition to the actions common to all action alternatives described under Alternative 2, above, Alternatives 3 and 4 would include substantial reconfiguration of program areas and public circulation, upgrades to existing concessioner administrative facilities, and enhanced kitchen and dining operations. Construction phasing for Alternatives 3 and 4 would occur over four or five summer seasons, respectively.

### **Analysis**

**Construction-related impacts:** Due to the seasonal phasing of this project, NPS and concessioner ski area operations are not expected to be adversely impacted by construction activities during implementation. Proposed utility and site drainage improvement at the ski area would impose an additional short-term, minor, adverse impact on the National Park Service due to the increased cost associated with construction oversight during the summer season.

Site assessments have established that some buildings and soil under the buildings may contain asbestos and /or lead paint. Standard mitigation measures included as part of project construction (see Appendix B) would reduce the magnitude of the impact to negligible and adverse.

Short-term, minor to moderate adverse impacts are expected for the YCC program currently using the Badger Pass Ski Lodge as a base camp. The program would move to a suitable location for the four or five seasons during which reconstruction activities are expected. In the long-term there would be a moderate, beneficial impact for the YCC program due to structural, code, and life-safety improvements at the lodge.

**Long-term impacts:** The long-term impacts of Alternatives 3 and 4 would be the same as under Alternative 2, with the following exceptions:

Alternatives 3 and 4 would both increase storage capacity for equipment rentals, primarily due to increased efficiency of program layout at the Alpine and Nordic rental facilities, as well as the Pups program area. With the increase in storage, there would be an associated slight increase in financial cost to the concessioner for the purchase of rental equipment. This would be expected to have a short-term, negligible to minor adverse impact.

Under Alternative 3, expanded bunkhouse accommodations would be provided in the west building, sufficient to accommodate current overnight staffing levels. In addition, both Alternatives 3 and 4 include designated employee break rooms and more efficient layouts for administrative offices. Likewise, both Alternatives 3 and 4 greatly improve the efficiency of kitchen operations; Alternative 4 would provide the optimal kitchen layout in terms of size and configuration in relation to dining areas.

Overall, Alternatives 3 and 4 would result in a local, long-term, moderate, beneficial impact on concessioner operations.

**Conclusion:** Similar to Alternative 2, implementation of Alternatives 3 or 4 would result in long-term, minor to moderate, beneficial impacts on concessioner operations due to a substantial reduction in annual maintenance requirements. There would be long-term, minor beneficial impact on NPS operations from the proposed relocation of interpretive functions to the west building; however, there would also be short-term and long-term negligible to minor adverse impacts on NPS operations due to increased cost associated with construction oversight and maintenance of new utility and site drainage infrastructure.

Under Alternatives 3 and 4, further modifications to the facility to enhance functionality of visitor services and administrative areas would result in a local, long-term, moderate, beneficial impact on concessioner operations.

### **Cumulative Impacts**

Past actions that have impacted operations within the project area include replacement of the Badger, Bruin, and Eagle ski lifts, life/safety shoring of the main lodge decking, remodel of the ground floor food service, lower and upper deck repairs, Alpine rental shop demolition and temporary modular shop installation, ski lodge emergency stabilization measures, and recently completed improvements to the ski area parking lot associated with the Glacier Point Road Rehabilitation Project. Ski lift projects have reduced associated maintenance. Stabilization projects have prolonged the use of the facility with no reduction in operational requirements, and installation of the temporary Alpine rental building has resulted in greater snow removal requirements. Recently completed improvements in the ski area parking lot included key drainage improvements to reduce ice accumulation in the parking lots and adjacent pedestrian areas used by visitors to access the lodge.

Reasonable foreseeable actions include construction of the Yosemite Environmental Education Center at Henness Ridge which could involve upgrades to existing power supply that services the Badger Pass Ski Area, and interim roof repairs. The cumulative actions in combination with Alternatives 3 and 4 are expected to result in a local, long-term, negligible to minor, beneficial impact on operations.

## **Transportation**

### **Affected Environment**

Yosemite National Park is accessed by three state highways: Highway 41 enters the park from the southwest at the South Entrance; Highway 120 enters the park at two locations, from the northwest at Big Oak Flat Entrance and from the east at Tioga Pass; and Highway 140 enters from the west side at El Portal. Highways 41, 140 and the western portion of 120 are considered year-round routes into the park. Once the highways reach park entrances, they transition to the internal park road system. There are no state highways within the boundaries of the park, although California highway numbers are used on park signs to help orient visitors. Highway 41, which becomes Wawona Road inside the park, provides access to the communities of Wawona and Yosemite West, as well as developed areas such as Glacier Point, Yosemite Valley, and Badger Pass Ski Area.

The Badger Pass Ski Area is accessed via Glacier Point Road, which connects to the Wawona Road at Chinquapin intersection. The entire Glacier Point Road closes to all vehicular traffic, with the exception of administrative use, in mid-November. A portion of the road from Chinquapin to Badger Pass reopens to visitor traffic when the ski area opens and remains accessible to vehicles for the ski season. The entire Glacier Point Road generally reopens at the end of May.

Visitors and employees access Badger Pass Ski Area year round by private and government-owned vehicles. In winter, private tour buses and daily Yosemite Transit System (YTS) shuttles from Yosemite Valley and Wawona provide additional access. The ski area parking lot holds approximately 628 vehicles, although this number may vary in winter depending on the parking configuration, which can change when snow packed conditions obscure pavement striping.

Pedestrian and vehicle circulation adjacent to the ski lodge are considered inadequate for the current types and amount of winter use and are not fully compliant with the Uniform Federal Accessibility Standards (UFAS). Per UFAS, the parking lot has an inadequate number of designated accessible parking spaces and lacks a clear passageway to the ski lodge entrance. There is no formal drop-off area for vans, and bus/shuttle drop-off occurs along an uncovered, high foot traffic area at the entrance road, where ice buildup presents a safety hazard and access is likewise not fully compliant with UFAS (DNC, Baldock, pers. comm. 2009; Page & Turnbull 2009d).

### **Environmental Consequences – Methodology**

This impact assessment focuses primarily on the effect of temporary, construction-related changes to traffic flow, access and circulation, and safety conditions. There would be no long-term changes to the parking lot, access roads or other transportation facilities under any alternative, beyond reconfiguration of the roadway immediately in front of and east of the ski lodge.

**Intensity:** The intensities of impacts consider whether the impact would be negligible, minor, moderate, or major. Negligible impacts are effects considered not detectable and would have no

discernible effect on traffic flow and/or traffic safety conditions. Minor impacts are 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 impacts would be clearly detectable and could have an appreciable effect on traffic flow and/or traffic safety conditions. Major impacts would have a substantial, highly noticeable influence on traffic flow and/or traffic safety conditions and could permanently alter those conditions.

**Type:** Impacts would be considered either beneficial or adverse on traffic flow and/or traffic safety conditions. Beneficial impacts would improve traffic flow and traffic safety by reducing levels of congestion and occurrences of vehicle/vehicle and vehicle/pedestrian conflicts. Adverse impacts would negatively alter traffic flow and traffic safety by increasing levels of congestion and occurrences of such conflicts.

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

**Construction-related impacts:** There would be no construction-related impacts on transportation under this alternative.

**Long-term impacts:** There would be no long-term changes to transportation systems under the No Action Alternative. Pedestrian safety and handicap-accessible parking and drop-off areas in front of the ski lodge would be inadequate.

**Conclusion:** Under Alternative 1, pedestrian safety and handicap-accessible parking and drop-off areas in front of the ski lodge would continue to be inadequate, resulting in a continued local, long-term, minor, adverse impact on transportation.

### Cumulative Impacts

Short-term adverse impacts on transportation could result from construction activities associated with some of the past, current and reasonably foreseeable actions planned or approved within the park. Past projects that have affected transportation include the construction and expansion of the ski area parking lot and recently completed drainage improvements to the ski area parking lot under the Glacier Point Road Rehabilitation project.

Present and future work at and near Badger Pass that would affect transportation includes construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-related traffic congestion on Glacier Point and Wawona Roads. Cumulatively, these projects would cause a local, short-term, minor, adverse impact on transportation on park roads.

## Environmental Consequences of Alternative 2

### Analysis

**Construction-related impacts:** Implementation of Alternative 2 would cause short-term adverse impacts on transportation resulting from construction-related traffic congestion. Slow-moving or oversized construction equipment could cause traffic delays on Wawona and Glacier Point Roads. In addition, some of the parking area at Badger Pass would be used as a staging area, and the access road to the ski lodge could be closed at certain times due to construction-related traffic. Impacts at Badger Pass Ski Area could affect onsite staff and recreational users, but recreational users are

expected to be few, since construction would take place during the summer when the area is little-used. Implementation of Alternative 2 is expected to require two seasons of construction. Construction-related impacts on transportation are not expected to occur during the winter season, when the majority of recreational users would be present in the area.

**Long-term impacts:** There would be no long-term changes to transportation systems under Alternative 2. Pedestrian safety and handicap-accessible parking and drop-off areas in front of the ski lodge would be inadequate.

**Conclusion:** Implementation of Alternative 2 would result in construction-related traffic congestion and use of parking lots as staging areas during two summer seasons. Pedestrian safety and handicap-accessible parking and drop-off areas in front of the ski lodge would continue to be inadequate. This alternative would result in local, short-term, minor, adverse, impacts on transportation.

### **Cumulative Impacts**

Short-term adverse impacts on transportation could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects that have affected transportation include the construction and expansion of the ski area parking lot and recently completed drainage improvements to the ski area parking lot under the Glacier Point Road Rehabilitation project.

Present and future work at and near Badger Pass that would affect transportation includes construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-related traffic congestion on Glacier Point and Wawona Roads. Cumulatively, these projects would cause a local, short-term, minor, adverse impact on transportation on park roads.

There are no long-term cumulative impacts on transportation anticipated.

## **Environmental Consequences of Alternative 3**

### **Analysis**

**Construction-related impacts:** Implementation of Alternative 3 is expected to require four seasons of construction. Types and levels of impacts on transportation would be the same as those described for Alternative 2, but would extend over a longer period of time.

**Long-term impacts:** Under this alternative, the roadway in front of (north of) the ski lodge would be reconfigured to have a pullout that would accommodate two buses, a narrower roadway in front of the Alpine rental building, and formalized parking spaces east of the Alpine building. ADA-compliant parking would be provided just east of the Alpine building, with an accessible path of travel to the ski lodge. This reconfiguration would not substantially change the amount of available parking. It would limit passenger drop-off in front of the lodge to those with disabled parking permits, and would require passengers to walk slightly further from the designated passenger drop-off area on the other side of the island to the lodge entrance. The narrowing of the roadway might also cause traffic passing by the front of the ski lodge to be somewhat slower, but overall, the change in configuration is expected to improve the traffic flow by regulating bus parking zones and eliminating haphazard parking in front of the ski lodge entrance.

Pedestrian safety would be improved by a formalized crosswalk across the roadway, linking a pathway through the island and the ski lodge, and a larger sidewalk zone along the north side of the entire ski lodge, including the Alpine rental building. However, under this alternative, pedestrian crossing, bus drop-off, and service deliveries would still all be located in the same area. While the situation is expected to be somewhat improved over that in Alternatives 1 and 2, there are still likely to be some pedestrian-vehicle conflicts and congestion in front of the ski lodge.

**Conclusion:** Implementation of Alternative 3 would result in local, short-term, minor, adverse impacts on transportation, due to construction-related traffic congestion and use of parking lots as staging areas during four summer seasons. However, once construction was complete, traffic flow in front of the ski lodge, pedestrian safety and ADA-compliant parking would be improved, resulting in local, long-term, minor, beneficial impacts on transportation.

### **Cumulative Impacts**

Short-term adverse impacts on transportation could result from construction activities associated with some of the past, current and reasonably foreseeable actions planned or approved within the park. Past projects that have affected transportation include the construction and expansion of the ski area parking lot and recently completed drainage improvements to the ski area parking lot under the Glacier Point Road Rehabilitation project.

Present and future work at and near Badger Pass that would affect transportation includes construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-related traffic congestion on Glacier Point and Wawona Roads. Cumulatively, these projects would cause a local, short-term, minor, adverse impact on transportation on park roads.

There are no long-term cumulative impacts on transportation anticipated.

## **Environmental Consequences of Alternative 4**

### **Analysis**

**Construction-related impacts:** Implementation of Alternative 4 is expected to require five seasons of construction. Types and levels of impacts on transportation would be the same as those described for Alternative 2, but would extend over a longer period of time. Construction-related impacts on transportation under this alternative would extend over a slightly longer period of time than that of Alternative 3.

**Long-term impacts:** Under this alternative, the roadway in front of (north of) the ski lodge would be reconfigured to have a pullout that would accommodate two buses, a narrower roadway in front of the Alpine rental building, and formalized parking spaces east of the Alpine building. ADA-compliant parking would be provided just east of the Alpine building, with an accessible path of travel to the ski lodge. This reconfiguration would not substantially change the amount of available parking. It would limit passenger drop-off in front of the lodge to those with disabled parking permits, and would require passengers to walk slightly further from the designated passenger drop-off area on the other side of the island to the lodge entrance. The narrowing of the roadway might also cause traffic passing by the front of the ski lodge to be somewhat slower, but overall, the change in configuration is expected to improve the traffic flow by regulating bus parking zones and eliminating haphazard parking in front of the ski lodge entrance.

Pedestrian safety would be improved by a formalized crosswalk across the roadway, linking a pathway through the island and the ski lodge. Under this alternative, the service entrance for deliveries would be at the far west end of the ski lodge. This is expected to improve operational transportation efficiency, and to reduce congestion and pedestrian-vehicle conflicts in front of the ski lodge.

**Conclusion:** Implementation of Alternative 4 would result in local, short-term, minor, adverse impacts on transportation, due to construction-related traffic congestion and use of parking lots as staging areas during five summer seasons. However, once construction was complete, traffic flow in front of the ski lodge, pedestrian safety, and ADA-compliant parking would be improved, resulting in local, long-term, moderate, beneficial impacts on transportation.

### **Cumulative Impacts**

Short-term adverse impacts on transportation could result from construction activities associated with some of the current and reasonably foreseeable actions planned or approved within the park. Past projects that have affected transportation include the construction and expansion of the ski area parking lot and recently completed drainage improvements to the ski area parking lot under the Glacier Point Road Rehabilitation project.

Present and future work at and near Badger Pass that would affect transportation includes construction of the Yosemite Environmental Education Center at Henness Ridge, and rehabilitation work on Glacier Point and Wawona Roads. The adverse effects from these construction activities would be localized and short-term in nature, and primarily related to construction-related traffic congestion on Glacier Point and Wawona Roads. Cumulatively, these projects would cause a local, short-term, minor, adverse impact on transportation on park roads.

There are no long-term cumulative impacts on transportation anticipated.

## **Energy Consumption and Global Climate Change**

### **Affected Environment**

#### **Planning Objectives, Regulations and Policies**

One of the management objectives for park operations, as outlined in previous planning efforts and Executive Order 13123, is to install facilities and utility systems that conserve energy. Design techniques and application of new technology to reduce energy and water consumption should be incorporated in the design of new facilities.

In April 1999, the U.S. Department of the Interior entered into a formal Memorandum of Understanding with the Department of Energy to promote the use of energy-efficient and renewable energy technologies and practices in national parks and to educate the visiting public about these efforts. This partnership officially inaugurated the program titled “Green Energy Parks: Making the National Parks a Showcase for a Sustainable Energy Future.” This initiative would help to fulfill provisions of the Energy Policy Act of 1992, which directs the use of energy-efficient building designs and equipment and the use of alternative motor fuels where practicable. The Energy Policy Act of 2005 incorporates previous Energy Policy Acts and directs the federal government to increase its renewable energy use, with a goal of using 3%, 5%, and 7.5% in incremental years through 2013.

NPS *Management Policies 2006* includes a section (Section 9.1.1.6) on sustainable energy design in the operation of park facilities. Section 9.1.1.6 states that any facility development must include improvements in energy efficiency and reduction in greenhouse gas emissions, and that such efficiency should be achieved using solar thermal and photovoltaic application, as well as appropriate insulations, energy-efficient lighting and appliances, and renewable energy technologies. Furthermore, this section states that energy-efficient construction projects should be used as an educational opportunity and that those built primarily for visitors must incorporate Leadership in Energy and Environmental Design (LEED) standards to achieve a silver rating.

NPS *Management Policies 2006* also includes a section (Section 9.1.7) on energy management in the operation of park facilities. Section 9.1.7 states that the National Park Service shall conduct its activities in ways that use energy wisely and economically, and that encourages the implementation of alternative transportation programs and the use of bio-based and alternative fuels. It also calls for the use of renewable sources of energy and new developments in energy efficiency technology, including products from the recycling of materials and waste, where appropriate and cost-effective over the life cycle of a facility. Lastly, the management policies call for the interpretation of resource protection benefits resulting from the efficient use of energy and education of park personnel and visitors to use sustainable practices in conserving energy. These policies are derived from the laws that have been enacted to establish and guide the administration of the national park system, including

- Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management
- Executive Order 13123, Greening the Government through Efficient Energy Management, which calls on federal agencies to take the lead in implementing energy conservation, maximizing the use of renewable resources, and reducing greenhouse gas emissions; and Executive Order
- Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance, signed in October 2009, which requires federal agencies to set a 2020 greenhouse gas emissions reduction target; increase energy efficiency; reduce fleet petroleum consumption; conserve water; reduce waste; support sustainable communities; and leverage federal purchasing power to promote environmentally-responsible products and technologies.

#### **Yosemite National Park Climate Action Plan**

Yosemite National Park participates in the Climate Friendly Parks Program implemented by the U.S. Environmental Protection Agency and the National Park Service, and has been designated a “Climate Friendly Park.” To obtain this designation, Yosemite has conducted a baseline greenhouse gas emissions inventory, developed a Climate Action Plan, and committed to educating park staff, visitors, and community members about climate change. The objective of the Climate Action Plan is to identify actions that Yosemite can undertake to reduce greenhouse gas emissions and thus address climate change. The Plan recommends three strategies, reduction of fuel use and greenhouse gas emissions, increasing climate change outreach and education efforts, perform subsequent emission inventories to evaluate progress, and develop future emission mitigation actions.

#### **Badger Pass Ski Lodge Energy Consumption**

Energy consumption at the Badger Pass Ski Lodge occurs year round. The highest use occurs between December and March, corresponding with the ski season.

The average annual energy consumption by the concessioner at the Badger Pass Ski Lodge from 2004 to 2008 includes:

- 340,000 kwh electricity
- 377,000 gallons propane
- 16,000 gallons of gasoline/diesel
- 18,400 gallons heating fuel

The energy consumption numbers listed above include operations at the ski lodge and associated concessioner operated buildings only, they do not include the total energy required to operate the Badger Pass Ski Area (concessioner operation of the ski lifts and associated concessioner or NPS vehicle use).

The Badger Pass Ski Lodge and associated concessioner-operated buildings are served by propane and diesel. The Alpine rental building and main lodge kitchen are served by two above ground propane tanks. The existing propane system is in fair condition; however the propane tanks are located too close to the Alpine rental building to meet current code requirements. The Nordic rental building is served by a propane tank that is likewise located too close to the building to meet current code requirements.

The Alpine rental building is heated by two forced air furnaces. Two diesel-fuel-fired “Modine” steam boilers currently heat the main lodge. The boilers are oversized for current heating load. The equipment is older; an additional 10-12 years of service with increasing maintenance can be expected. The steam distribution system components and condensate pump at end of useful life. The generator and boilers are served via a 500 gallon fuel oil tank located below ground, northwest of the retail addition; the fuel tank is double walled with a leak protection system installed in 2004.

A primary 12 KV feeder is provided from a PG&E substation in El Portal. The power is transformed to 120/208V for distribution via a PG&E owned transformer located outside the building. The main feeder from PG&E is reportedly overloaded. The emergency power system consists of a 60kW generator and manual transfer switch. In the event of our power outage, an operator is required to switch power to the generator; the system is undersized for facility requirements.

## **Environmental Consequences – Methodology**

This impact assessment focuses primarily on the effect of changes in expected energy consumption and the corresponding green house gas emissions changes that would occur due to incorporation of energy efficient infrastructure and design. Green house gas emissions for the alternatives have not been quantified because they represent a small proportion of park wide emissions. Emissions from the alternatives would contribute to cumulative global climate change caused by global green house gas emissions. However, cumulative impacts of the alternatives on global climate change are not considered significant because it is not possible to discern the effects of these emissions on global climate change.

**Duration:** In terms of duration, short-term impacts last only as long as the construction period. Long-term impacts would last beyond the construction period, such as a permanent change to fuel type or consumption, due to the implementation of the proposed alternative.

**Intensity:** The analysis of energy consumption was based on a comparison of energy use by the Badger Pass Ski Lodge under each alternative. The intensities of impacts consider whether the impact would be negligible, minor, moderate, or major. Negligible impacts are effects considered not detectable and would have no discernible effect on energy use. Minor impacts are effects that would be slightly detectable, but not expected to have an overall effect on energy use. Moderate impacts would be clearly detectable and could have an appreciable effect on energy use. Major impacts would have a substantial, highly noticeable influence on energy use.

**Type of Impact:** For purposes of this analysis, implementation of an alternative is assumed to have an adverse impact if it results in an increase in overall annual energy consumption or reliance on natural gas and oil. A beneficial impact would result in a decreased overall annual energy consumption or reliance on natural gas and oil, an increased use of renewable energy (e.g., photovoltaic cells, wind, geothermal) or the incorporation of energy-efficient design.

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

**Construction-related impacts:** There would be no short-term construction-related impacts on energy consumption under this alternative.

**Long-term impacts:** There would be no long-term changes to energy consumption under the no-action alternative. Implementation of the No Action Alternative would not help the National Park Service in achieving its goals of reduced energy and water consumption, or increased use of alternative fuels. Existing mechanical, electrical, ventilation, heating, and water systems would remain inefficient and nearing obsolescence.

**Conclusion:** Under Alternative 1, energy consumption would continue to be inefficient, resulting in a local, long-term, minor adverse impact on energy consumption.

### Cumulative Impacts

Cumulative effects to energy consumption are based on analysis of past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of this alternative.

Past actions include the Chinquapin Restore Rest Stop Structures project which installed water saving devices. Reasonably foreseeable projects that would incorporate new sustainable technology and cumulatively affect energy consumption include the construction of a new Yosemite Environmental Education Center, and the new Merced Wild and Scenic River Comprehensive Management Plan, which is intended to guide administrative and visitor use in Yosemite Valley, Wawona, and El Portal.

The cumulative actions in combination with Alternative 1 are expected to result in a local, long-term, minor, beneficial impact on energy consumption.

## Environmental Consequences of Alternative 2

### Analysis

Under all action alternatives, mechanical, electrical, plumbing, and life-safety systems would be upgraded to meet basic code standards. Energy efficient and water conserving systems would be employed with replacement systems to the degree possible. A mechanical ventilation system would

be installed, improving the buildings energy efficiency. A hydronic snowmelt system would be installed at the decks and portions of the roof to increase the efficiency of snow management operations. Emergency generator and power systems would be upgraded. The Badger Pass Ski Lodge would continue to be served by propane and diesel. Existing boilers for heat and hot water and their distribution system components would remain.

In addition, all action alternatives would result in the replacement of the Alpine building and Nordic rental building with more energy efficient buildings with sustainable design. These new buildings would include restrooms. Construction phasing for Alternative 2 would occur over two summer seasons.

Implementation of this alternative would help meet the National Park Service goals and objectives of achieving a reduction in energy use through improved building design and efficiencies.

**Construction-related impacts:** Implementation of Alternative 2 would cause a short-term increase in gasoline and diesel fuel use due to on site construction and truck trips supplying materials and/or workers over a period of two seasons.

**Long-term impacts:** Implementation of improvements in Alternative 2 would result a more energy efficient facility due to mechanical and ventilation upgrades and is expected to result in an overall reduction in annual energy use. The implementation of this alternative would not cause measurable increases or decreases in the overall consumption of gas or diesel for mobile sources associated with the continued operation and maintenance of facilities at Badger Pass Ski Lodge. There would be a small increase in power demand due to the installation of a hydronic snow melt system. Overall, this alternative would help achieve the National Park Service objectives of energy conservation and efficiency through improved building design and efficiencies.

**Conclusion:** Implementation of Alternative 2 would cause a short-term increase in gasoline and diesel fuel consumption during two seasons of construction.

Upgrades to mechanical and ventilation systems would reduce energy requirements and the installation of a new boiler system would improve efficiency. There would be a small increase in power demand due to the installation of a hydronic snow melt system. Overall this alternative would be expected to reduce energy consumption, compared to Alternative 1, and would be expected to reduce energy consumption, better help the National Park Service reach its overall energy conservation objectives, and reduce overall contribution to global greenhouse gas emissions. Alternative 2 would result in local, long-term, negligible, beneficial impacts on energy consumption.

### **Cumulative Impacts**

Past actions include the Chinquapin Restore Rest Stop Structures project which installed water saving devices. Reasonably foreseeable projects that would incorporate new sustainable technology and cumulatively affect energy consumption include the construction of a new Yosemite Environmental Education Center, and the new Merced Wild and Scenic River Comprehensive Management Plan, which is intended to guide administrative and visitor use in Yosemite Valley, Wawona, and El Portal.

The cumulative actions in combination with Alternative 2 are expected to result in a local, long-term, minor, beneficial impact on energy consumption.

## Environmental Consequences of Alternative 3

### Analysis

As in Alternative 2, mechanical, electrical, plumbing, and life-safety systems would be upgraded to meet basic code standards. Energy efficient and water conserving systems would be employed with replacement systems to the degree possible. A mechanical ventilation system would be installed improving the buildings energy efficiency. A hydronic snowmelt system would be installed at the decks and portions of the roof to increase the efficiency of snow management operations. Emergency generator and power system would be upgraded. The Badger Pass Ski Lodge would continue to be served by propane and diesel.

The Alpine building and Nordic rental building would be replaced with more energy efficient buildings with sustainable design. These new buildings would include restrooms.

Alternative 3 would include removal of the Winter Club Room and breezeway connection, modifications and additions to the west building and the main lodge. The steam heating boilers and distribution system would be replaced, additional mechanical ventilation would be provided in the ski lodge, and a new heating system installed for the new Alpine rental building. The ski lodge would be rehabilitated with a fireplace fueled by propane or wood. Construction phasing for Alternative 3 would occur over four summer seasons.

Implementation of this alternative would help meet the National Park Service goals and objectives of achieving a reduction in energy use through improved building design and efficiencies.

**Construction-related impacts:** Implementation of Alternative 3 would cause a short-term increase in gasoline and diesel fuel use due to on site construction and truck trips supplying materials and/or workers over a period of four seasons.

**Long-term impacts:** Implementation of the improvements in Alternative 3 would result a more energy efficient facility due to upgrades in mechanical and ventilation systems as well as replacement of the existing boiler system. Overall a reduction in annual energy use is expected to result. The implementation of this alternative would not cause measurable increases or decreases in the overall consumption of gas or diesel for mobile sources associated with the continued operation and maintenance of facilities at Badger Pass Ski Lodge. There would be a small increase in power demand due to the installation of a hydronic snow melt system. Overall, this alternative would help achieve the National Park Service objectives of energy conservation and efficiency through improved building design and efficiencies.

**Conclusion:** Implementation of Alternative 3 would cause a short-term increase in gasoline and diesel fuel consumption during four seasons of construction. As under Alternative 2, upgrades to mechanical and ventilation systems and installation of a new boiler system would reduce future diesel requirements. There would be a small increase in power demand due to the installation of a hydronic snow melt system. The installation of a fireplace is expected to increase propane or wood energy use. Overall, this alternative would be expected to reduce energy consumption, better help the National Park Service reach its overall energy conservation objectives, and reduce overall contribution to global greenhouse gas emissions, when compared with Alternative 1. Alternative 3 would result in a local, long-term, negligible, beneficial impact on energy consumption.

### **Cumulative Impacts**

Past actions include the Chinquapin Restore Rest Stop Structures project which installed water saving devices. Reasonably foreseeable projects that would incorporate new sustainable technology and cumulatively affect energy consumption include the construction of a new Yosemite Environmental Education Center, and the new Merced Wild and Scenic River Comprehensive Management Plan, which is intended to guide administrative and visitor use in Yosemite Valley, Wawona, and El Portal.

The cumulative actions in combination with Alternative 3 are expected to result in a local, long-term, minor, beneficial impact on energy consumption.

## **Environmental Consequences of Alternative 4**

### **Analysis**

As in Alternative 2, mechanical, electrical, plumbing, and life-safety systems would be upgraded to meet basic code standards. Energy efficient and water conserving systems would be employed with replacement systems to the degree possible. A mechanical ventilation system would be installed improving the buildings energy efficiency. A hydronic snowmelt system would be installed at the decks and portions of the roof to increase the efficiency of snow management operations. Emergency generator and power system would be upgraded. The Badger Pass Ski Lodge would continue to be served by propane and diesel.

The Alpine building and Nordic rental building would be replaced with more energy efficient buildings with sustainable design. These new buildings would include restrooms.

Alternative 4 includes modifications to all portions of the facility. Removal of the west building, Winter Club Room and breezeway connection, and modifications to the main lodge are proposed. The ski lodge would be rehabilitated with a fireplace fueled by propane or wood. Construction phasing is expected to occur over five summer seasons.

Implementation of this alternative would help meet the National Park Service goals and objectives of achieving a reduction in energy use through improved building design and efficiencies.

**Construction-related impacts:** Implementation of Alternative 4 would cause a short-term increase in gasoline and diesel fuel use due to on site construction and truck trips supplying materials and/or workers over a period of five seasons.

**Long-term impacts:** Implementation of improvements in Alternative 4 would result a more energy efficient facility due to upgrades in mechanical and ventilation systems, replacement of boiler systems and new construction for much of the project (excluding rehabilitation of the original ski lodge). There would be a small increase in power demand due to the installation of a hydronic snow melt system, however, an overall reduction in annual energy use is expected. The implementation of this alternative is not expected to cause measurable increases or decreases in the overall consumption of gas or diesel for mobile sources associated with the continued operation and maintenance of facilities at Badger Pass Ski Lodge. This alternative would help achieve the National Park Service objectives of energy conservation and efficiency through improved building design and efficiencies.

**Conclusion:** Implementation of Alternative 4 would result in a short-term increase in gasoline and diesel fuel consumption during five seasons of construction. As under Alternatives 2 and 3,

upgrades to mechanical and ventilation systems and installation of a new boiler system would reduce future diesel requirements. There would be a small increase in power demand due to the installation of a hydronic snow melt system. The installation of a fireplace is expected to increase propane or wood energy use.

Overall, Alternative 4 would best help achieve the National Park Service objectives of energy conservation and efficiency when compared to Alternatives 2 and 3 due to the extent of new construction under this alternative. However overall, this alternative would result in a local, long-term, negligible to minor, beneficial impact on energy consumption compared to Alternative 1.

### **Cumulative Impacts**

Past actions include the Chinquapin Restore Rest Stop Structures project which installed water saving devices. Reasonably foreseeable projects that would incorporate new sustainable technology and cumulatively affect energy consumption include the construction of a new Yosemite Environmental Education Center, and the new Merced Wild and Scenic River Comprehensive Management Plan, which is intended to guide administrative and visitor use in Yosemite Valley, Wawona, and El Portal.

The cumulative actions in combination with Alternative 4 are expected to result in a local, long-term, minor, beneficial impact on energy consumption.

## **American Indian Traditional Cultural Practices**

### **Affected Environment**

Traditional cultural practices involve culturally valued real property; social use of the biophysical, geophysical, or built environment; and socio-cultural attributes, including social cohesion, lifeways, religious practices, and other social institutions such as education and recreation that play out in the biophysical and built environment. The cultural value of these resources may have acquired a historic merit by their repeated use over time, but they do not meet the standards for consideration as historic properties listed in the National Register of Historic Places.

Humans are an integral part of Sierra Nevada ecosystems, having lived and sustained themselves in the region for at least 10,000 years. Indigenous populations were widely distributed throughout the region at the time of European immigrations. The area now known as Yosemite was included in the territory of Miwok, Paiute, Mono, and Yokut Indians. Archeological and anthropological evidence indicates considerable interaction between these groups.

American Indian people have ongoing traditional cultural associations with Yosemite National Park and its resources. The National Park Service consults with American Indian people about management of park lands, especially regarding the nature of the undertakings and potential impacts on park resources. Some of the primary concerns are access to park areas for traditional cultural practices, management of resources, and protection of archeological sites and other sites to which American Indians attach religious and cultural significance.

There is little specific information on the project site, relative to other well-documented areas of the park. The area is most closely associated with the Sierra Miwok, specifically with the Pohonichi Miwok identified in the earliest records for the vicinity. Traditional places and resources have been recorded for the general vicinity, including named camps, trails, and resource procurement sites; however, none have been recorded for the project site specifically. Inspection of the high elevation

meadow (Monroe Meadow) at the ski area site indicated the presence of several plants used by Native Americans for food and medicine and in traditional arts. Initial consultation with the Miwok and North Fork Mono communities yielded general reference to use of the area.

Potential resources in the immediate project vicinity include several plant species which may have traditional medicinal, artistic, or nutritional value. Members of the Southern Sierra Miwok Nation have indicated that the meadow and the surrounding area were an important source of medicinal and food plants, as well as crafts, and remain so today (Albion 2009). A member of the North Fork Mono Rancheria told of oral family traditions relating to the ancestral use of trails in the Badger Pass area for foraging, hunting, trade, and social excursions (e.g., visiting family members)(Albion 2009).

## **Environmental Consequences - Methodology**

Methodologies used to evaluate traditional cultural practices are defined earlier in this chapter, beginning on page 3-5, under Methods for Analyzing Environmental Consequences, Impacts Analysis – General.

## **Environmental Consequences of Alternative 1 (No Action)**

### **Analysis**

There would be no ground disturbance in meadow vegetation under the No Action Alternative, beyond that necessary for emergency repairs to the ski lodge and associated utilities. This potential ground disturbance would be limited to previously disturbed locations; therefore, this alternative is expected to have no impact on traditional cultural practices. There could be small adverse impacts on plants traditionally used in the area due to normal ski area operations, but these are not expected to affect plant populations or access to traditional resources.

**Conclusion:** Under Alternative 1, there could be small adverse impacts on plants traditionally used in the area, due to normal ski area operations. This alternative would result in a long-term, local, negligible adverse impact on traditional cultural practices.

### **Cumulative Impacts**

Past, present and reasonably foreseeable future actions which could contribute to adverse cumulative impacts on plants traditionally used in the area would include the construction of the ski lodge itself; past and present routine maintenance activities, emergency stabilization measures, repairs to structures and utilities, terrain park relocation, demolition and restoration of the rental shop, installation of temporary rental facilities, and the past replacement of the Eagle, Badger, and Bruin ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a local, short-term, direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have local, beneficial, direct and indirect, long-term, minor impacts on plants traditionally used in the project vicinity.

### **Impairment**

Because there would be no change to the natural and cultural integrity of Yosemite National Park under Alternative 1, traditional cultural practices in Yosemite National Park would not be impaired.

### **Environmental Consequences of Alternatives 2 and 3**

Alternatives 2 and 3 would have the same effect on traditional cultural practices, therefore they are addressed together.

### **Analysis**

Alternatives 2 and 3 have the potential to affect some plant species with traditional value to American Indian people, due to ground disturbance in the meadow associated with implementation of the alternative actions. The extent of ground disturbance beyond the existing disturbed footprint would be the same for these alternatives, and would be minimal. In addition, access to areas of traditional resources could be limited during periods of construction, which are expected to last two summer seasons under Alternative 2, and four summer seasons under Alternative 3. These impacts would be temporary in nature and are not expected to cause any long-term impacts on plant populations or access to traditional resources.

**Conclusion:** Under Alternatives 2 and 3, ground disturbance and limited access associated with construction activities could impact some traditional cultural resources, with an increased potential for effects under Alternative 3 due to the longer construction timeframe. This would result in a short-term, local, minor, adverse impact on traditional cultural practices.

### **Cumulative Impacts**

Past, present and reasonably foreseeable future actions which could contribute to adverse cumulative impacts on plants traditionally used in the area would include the construction of the ski lodge itself; past and present routine maintenance activities, emergency stabilization measures, repairs to structures and utilities, terrain park relocation, demolition and restoration of the rental shop, installation of temporary rental facilities, and the past replacement of the Eagle, Badger, and Bruin ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a local, short-term, direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have local, long-term, minor, direct and indirect beneficial impacts on vegetation.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternatives 2 and 3 would likely result in local, short-term, minor, direct, adverse impacts on plants traditionally used within the project vicinity.

### **Impairment**

Because there would be no change to the natural and cultural integrity of Yosemite National Park under Alternatives 2 and 3, traditional cultural practices in Yosemite National Park would not be impaired.

## Environmental Consequences of Alternative 4

### Analysis

This alternative has the potential to affect some plant species with traditional value to American Indian people, due to ground disturbance in the meadow associated with implementation of the alternative actions. The extent of ground disturbance beyond the existing disturbed footprint would be slightly more (approximately 224 square feet) than that of the other action alternatives, but would still be minimal. In addition, access to areas of traditional resources could be limited during periods of construction, which are expected to last five summer seasons under Alternative 4. These impacts would be temporary in nature and are not expected to cause any long-term impacts on plant populations or access to traditional resources.

**Conclusion:** Under Alternative 4, ground disturbance and limited access associated with construction activities could impact some traditional cultural resources due to the longer construction timeframe, and permanent extension of the Alpine rental building further into the meadow area. This alternative would result in a short-term, local, minor, adverse impact on traditional cultural practices.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions which could contribute to cumulative impacts on plants traditionally used in the area would include the construction of the ski lodge itself; past and present routine maintenance activities, emergency stabilization measures, repairs to structures and utilities, terrain park relocation, demolition and restoration of the rental shop, installation of temporary rental facilities, and the past replacement of the Eagle, Badger, and Bruin ski lifts. These actions would result in disturbance to vegetation within the project area and thus would have a local, short-term, direct, adverse impact. Relative to the total size of Badger Pass Ski Area, these impacts would be considered minor.

Potential actions under the park's *Invasive Plant Management Plan*, *Aquatic Ecosystem Recovery and Stewardship Plan*, and *Fire Management Plan* would result in the protection or enhancement of vegetation within the project area and thus would have local, long-term, minor, direct and indirect, beneficial impacts on plants traditionally used in the area.

Overall, past, present and reasonably foreseeable future actions within the project area in combination with the potential effects of Alternative 4 would likely result in local, short-term, minor, direct, adverse impacts on plants traditionally used within the project vicinity.

### Impairment

Because there would be no change to the natural and cultural integrity of Yosemite National Park under Alternative 4, traditional cultural practices in Yosemite National Park would not be impaired.

# Historic Properties

## Historic Sites, Buildings, and Cultural Landscapes

### **Affected Environment**

The following is a detailed description of the area of potential effect for this project, which includes the entire Badger Pass Ski Area historic site. Any impacts to character-defining or contributing features of the historic site, including Badger Pass Ski Lodge, are described in the subsequent impacts analysis.

The Badger Pass Ski Area is a historic site which derives significance at the local level under National Register Criterion A (Event) in the areas of Entertainment/Recreation and the context of Tourism, Recreation and Preservation Ethic, as one of California's earliest developed downhill ski areas. During the period of significance, 1934 to 1953, Badger Pass was a leader in ski instruction and the setting for professional and amateur downhill competitions. The site is significant to the history of cross-country and downhill skiing in the United States and is associated with the development of recreation and winter sports in Yosemite National Park.

The boundary for the Badger Pass Ski Area encompasses the entire 282-acre developed ski area as well as the Badger Pass Access Road from Glacier Point Road to the site. The historic site boundary encompasses all of the historically significant features at Badger Pass and does not extend into any designated wilderness area (Figure 3-2).

The Badger Pass Ski Area was identified as a potential contributing component of the Glacier Point Road Historic District as documented in the Glacier Point Road Cultural Landscapes Inventory completed in 2007. In the 2007 Cultural Landscapes Inventory, which serves as the Determination of Eligibility for the Glacier Point Road Historic District, Badger Pass and two other sites were identified as "sites within the district whose contribution will be determined at a future point."

A 2009 Badger Pass Ski Area Determination of Eligibility by Page & Turnbull provided the first official documentation of the Badger Pass Ski Area's eligibility for inclusion in the National Register. The California State Historic Preservation Officer concurred with the Determination of Eligibility in December 2009. According to the 2009 Determination of Eligibility, the Badger Pass Ski Area is most appropriately documented as a historic site within the Glacier Point Road Historic District geographic and cultural area, and is eligible as a historic site for listing in the National Register of Historic Places at the local level of significance under Criterion A (Event) in the areas of Entertainment/Recreation and the context of Tourism, Recreation and Preservation Ethic as one of California's earliest developed downhill ski areas. The period of significance is 1934 to 1953, covering the period that Badger Pass was at the forefront of California's ski culture as a leader in ski instruction and the setting for downhill competition. A draft Multiple Property Document Form for the park prepared in 2004 by Andrew Kirk and Charles Palmer, with the University of Nevada at Las Vegas' Public History Program, similarly identifies the Badger Pass Ski Area as a winter sports area within the "Resources Associated with Tourism, Recreation and the Preservation Ethic in Yosemite (1864-1973)" property type.

The Badger Pass Ski Area includes character-defining features from its period of significance, 1934 to 1953, which contribute to the property's ability to convey its significant associations, as well as to all seven aspects of its integrity: location, design, setting, materials, workmanship, feeling, and association. These characteristics include natural systems and features, spatial organization, land use, circulation, topography, vegetation, buildings and structures, views and vistas, and small-scale features. The overall spatial organization and land use patterns are defined by a single access road, series of parking loops, central lodge building, and the bowl-shaped ski area, and remain unchanged since the period of significance. Native vegetation and topography define the boundary and organization of the ski area as it was originally developed, and together with views and natural systems, contribute to the site's historic setting.

The following descriptions of contributing features to the Badger Pass Ski Area historic site are directly extracted from the Determination of Eligibility prepared by Page & Turnbull, Inc. (Page & Turnbull 2009e).

### **Contributing Buildings and Structures**

Since the construction of the up-ski in 1934 and the ski lodge in the year following, buildings and structures have been an important component of the Badger Pass Ski Area. The establishment of buildings and structures on the site marked the official development of the ski area, while the subsequent changes in number and character of the buildings and structures were the physical manifestations of the rise of the ski area during the period of significance. Several alterations and additions were made to the buildings and structures over time to accommodate the need for increased visitor capacity and services. Almost immediately upon completion of the ski lodge, plans were made to expand its facilities and the building underwent a series of alterations as early as 1936, including minor alterations in 1938.

Alterations and additions that occurred to the ski area after 1953 marked a shift in the programmatic focus of the site from a competitive downhill ski area to a more family-centered ski facility. Major alterations between 1954 and 1956 included the construction of a shed-roof addition to the west of the original lodge and alteration between 1957 and 1968. Building modifications from 1954 through 2005 have obscured the original appearance and character-defining features of the building, and marked a clear departure from the sympathetic alterations and additions that were made during the period of significance. Extensive modifications have been made to its exterior and interior, while additional buildings constructed after the period of significance have been introduced to meet the evolving programmatic needs of the ski area. Many of these buildings do not relate appropriately to historic views, vistas, and spatial organization, and are incompatible with the character of the area's historic buildings and structures.

***Badger Pass Ski Lodge:*** The Badger Pass Ski Lodge was constructed in 1935 to provide permanent facilities for downhill skiing operations at Badger Pass. Located at the base of Monroe Meadow, the original building was designed in the NPS Rustic style with Swiss Chalet style influences by Eldridge T. Spencer. The two-story, wood frame building featured cubic massing, a dramatic gable roof, and rustic finishes. The main (north) façade faced the parking area while the rear (south) façade faced the meadow and the ski slopes above.

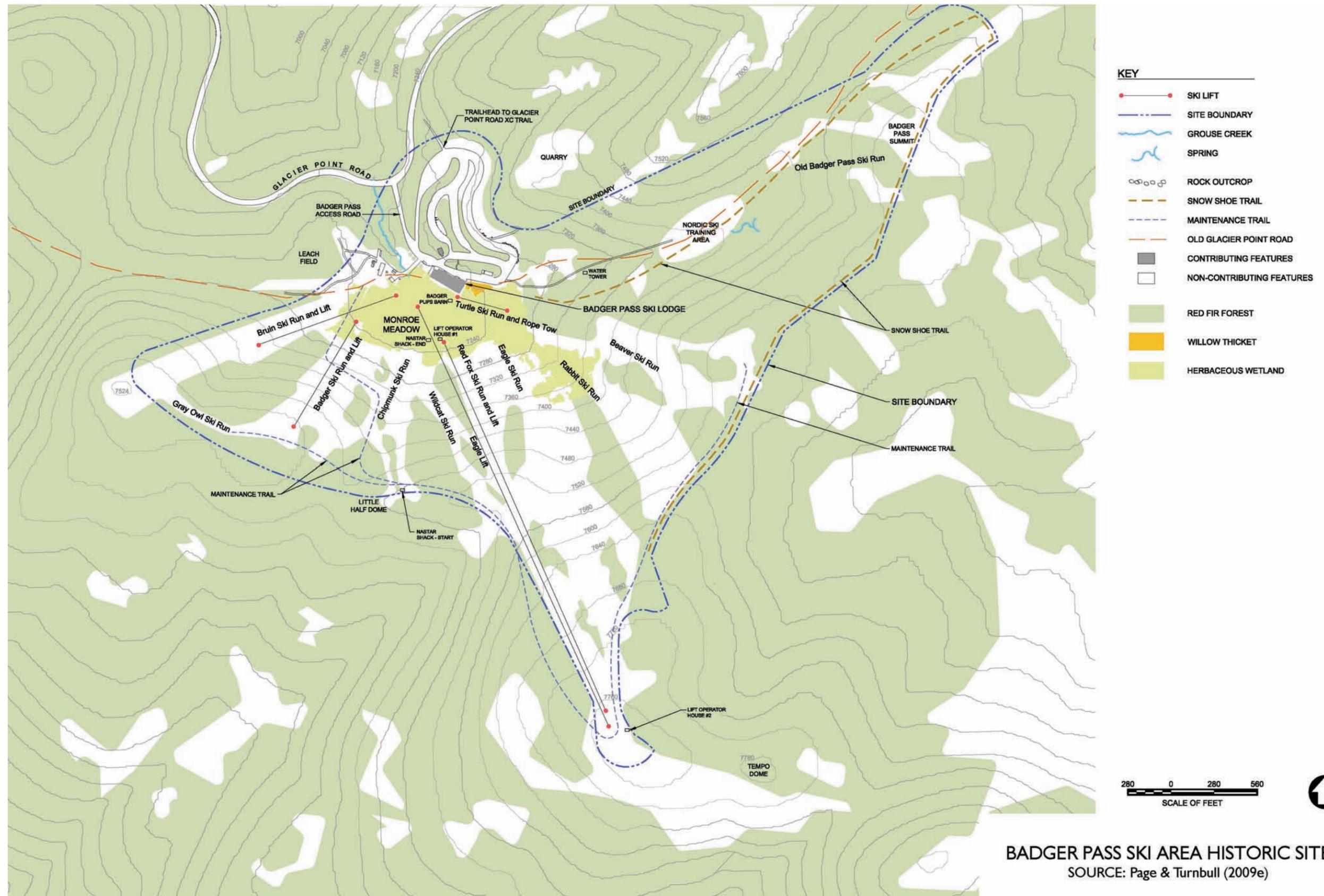


Figure 3-2 Badger Pass Ski Area Historic Site.

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According to the drawings, the proposed “Ski House at Monroe Meadows” would primarily function as a ski house and lounge to serve skiers and spectators, who could take advantage of the sweeping views of the slopes from the lounge and deck. The lounge would be the main destination for visitors; it was to be lined with partially-glazed wood doors on the south façade, to take advantage of the view to the ski slopes. The lounge opened onto a large wood deck and features stairs to the ski fields. This room, the most prominent space in the ski lodge, included exposed trusses, unpainted board-and-batten wood walls, concrete/stone floors, lantern-style light fixtures, and an oversize fireplace with a flagstone hearth with decorative cast iron metal panels by artist Robert Boardman Howard. The furniture, designed for the space, included chairs and an oversized sectional sofa, all with rustic wood bases. Wood dining tables and chairs with turned legs were used to serve visitors, skiing or not, who could bring their own lunch or enjoy short-order food service in the lounge or on the deck in good weather.

In addition to the lounge, the first floor was designed to include a lobby with a heater running the length of the room at the north façade. A ski room (for rental and service) was included at the southwest portion of the first floor. Service rooms, including a kitchen, restrooms, storage, and a garage were located at the northeast portion of the first floor. The basement included a boiler room and battery room at the north, an ash pit below the fireplace, and wood storage. The second floor was accessed by an octagonal shaped wood stair from the first floor. A mezzanine was located at the west and included a view to the lounge and fireplace below. The caretaker’s apartment was located in the northeast portion of the second floor and included a bedroom, restroom, and closets with access to the first floor service area through a narrow service stair. Balconies were located along the east, south, and north façades.

The north façade was similar in materials and detailing to the south façade. The north façade included a recessed central entry porch, and a projecting bay. The first floor of the north façade featured four-light wood-sash windows, and paired, partially glazed, multi-light wood doors. The second floor featured four-light wood-sash windows.

The east façade featured log slab siding, a wide overhanging eave supported by wood posts, and no fenestration. The west façade featured log slab siding and a shed-roofed porch supported by wood posts.

Almost immediately upon completion of the ski lodge, plans were made to expand its facilities and the building underwent a series of alterations over time. These alterations began as early as 1936 and included minor alterations in 1938, and major alterations completed between 1954 and 1956 when a shed-roof addition was constructed to the west of the original ski lodge. Additional alterations were made between 1957 and 1968, the building was stabilized in 1996, and emergency deck repairs were made in 2005 and 2007.

Currently, the building houses the ticketing, food services, restrooms, meeting space, and offices associated with the ski operations on site. Although the appearance of the building reflects the many additions and alterations made to it over time and differs from its appearance during the period of significance, the overall character, use, and understanding of the building and its function within the greater site are clearly evident. Further intensive investigation into the exterior and interior elements of the ski lodge would be required to assess whether any character-defining materials and features might be extant that have been otherwise obscured by these previous additions and alterations.

**Ranger Residence:** In 1930 to 1940, the CCC constructed the NPS Ranger Residence, the first permanent NPS building at Badger Pass. The building was completed in January 1940, and located across the Badger Pass Access Road, north of the ski lodge and directly west of the median of the original parking loop. The Ranger Residence is a one-story, wood frame building on a stone foundation, designed in a simplified NPS Rustic style. The main entrance is located at the southeast side of the building and is accessed by a flight of concrete stairs. The rectangular-plan building has a small entry porch, which appears to have been added at a later date, and a gable roof. There is also an addition at the rear of the building. Currently, the building is a residence for NPS rangers.

**Water Tower:** A historic site plan of Badger Pass indicates the presence of the water tower by 1942, located in the vegetated area to the east of the ski lodge. This feature provided much needed infrastructure to support visitor services on site and was important to the overall operation of the ski area during the period of significance. The water tower was replaced in circa 1988 with a new water tower structure in the same location as the historic feature.

### **Contributing Circulation Features**

**Badger Pass Access Road:** The Badger Pass Access Road contributes to the site as the major circulation route providing vehicular access to the Badger Pass Ski Area. Approximately 5 miles from the turnoff onto Glacier Point Road, Badger Pass Access Road provides entry to the ski area and parking lots. This approximately 0.2-mile road was constructed concurrently with the ski lodge to provide vehicular entry into the site. The character of the road is defined by its slightly curved shape, width, cross slope, and pitch at the curves, as well as its slightly upward slope towards the Badger Pass Ski lodge. The Badger Pass Access Road was designed to provide tree-framed vistas to the ski lodge and ski area beyond. This visual experience was an important part of the visitor experience at Badger Pass throughout history. The road was widened by the CCC in 1938; however, this change did not significantly alter the character of the road, its relationship to the ski area, or associated framed views. Today, the view of the ski lodge from the access road has been obscured by the 1954-1956 addition to the building and a support trailer parked to the west of the ski lodge in the summer months.

**Original Parking Loop (1936):** The Original Parking Loop contributes to the site as a feature that was designed to accommodate increased visitor capacity during the period of significance. The original Parking Loop is located just north of the ski lodge, accessed via the Badger Pass Access Road to the west. The loop was completed in 1936 and features a slight slope upwards to the northeast. When first constructed, the parking loop consisted of two strips and had the capacity for 200 vehicles. The loop is oriented east-to-west and features an island with a stand of conifer trees and two footpaths that lead from the parking loop to the north ski lodge entrance.

**Parking Loop (1941):** The 1941 Parking Loop contributes to the site as a feature that was added to accommodate increased visitor capacity during the period of significance. The parking area was expanded to the north in several campaigns, the first of which was completed in 1941 and provided capacity for an additional 200 vehicles. The 1941 Parking Loop is located in the middle of the three parking extension loops to the north of the original loop.

**Ski Area Boundary Trail:** The Ski Area Boundary Trail contributes to the site as a feature that provided cross-country and snowshoe access through the site during the period of significance, and was an important part of the early experience of Badger Pass. Today, the trail delineates the

boundary of the Badger Pass Ski Area. Portions of the Ski Area Boundary Trail were established with the development of the Badger Pass Ski Area in 1934. The earliest portion of the trail begins at the parking area where it follows Old Glacier Point Road and continues along the treeline of the Beaver Ski Run and along the ridgeline at the southeast edge of the site. The boundary trail continues south to the top of the Eagle and Red Fox lifts, before it turns and follows the treeline of Chipmunk Ski Run. The trail continues to the west along the ridgeline and is marked with signage that reads “Ski Area Boundary,” before it turns at the top of the Badger and Bruin lifts and connects to the maintenance area. The boundary trail is not clearly marked or evident between the maintenance area and the west side of the parking area. The trail consists of an unpaved dirt surface that is groomed in the winter and lined by stands of conifer trees.

### **Associated Views and Vistas**

Significant views and vistas are also associated with the historic setting of the Badger Pass Ski Area historic site and contribute to the relationship between the landscape and its buildings and structures. These include views to and from the lodge, ski runs, and the surrounding landscape, as the ski area was designed to provide both inward and outward views of the lodge and the surrounding scenic landscape. While additions and alterations to the ski lodge have altered views to the lodge from the runs, the most expansive views to the surrounding mountains and within the ski area remain and continue to contribute to the historic character of the site. Two significant views associated with the setting are described in the Determination of Eligibility (Page & Turnbull 2009e) as:

***Views from Badger Pass Ski Lodge to Slopes:*** There is an expansive view from the south deck of the lodge to the meadow to the south and the ski runs above. From this vantage point, from west to east, are the ski runs as well as the associated lifts and vegetation that frame these runs. Currently, the temporary Alpine rental building partially obstructs the view from the lodge to two of the runs (Rabbit and Beaver ski runs). This view dates to the construction of the lodge in 1935 as the overall configuration and character of the ski runs has not dramatically changed.

***Views from Slopes to Badger Pass Ski Lodge:*** Historic photographs show that framed views from the ski slopes to the lodge have always been a focal point of the downhill skiing experience at Badger Pass. These views were created when the lodge was constructed in 1935. Views from the ski slopes to the lodge also help orient visitors skiing on the runs. Due to the alterations to the ski lodge and its resulting change in appearance, the views to the lodge from the ski runs have dramatically changed over time. The once elegant views to the lodge have been compromised by later additions to the building, which have changed the exterior appearance of the lodge. Views to the lodge have also been partially obscured by the construction of non-contributing structures in the maintenance yard and temporary rental buildings. Despite changes to the appearance of the lodge over time, the location of the lodge has remained unchanged and the views from the slopes to the lodge are still present today.

### **Integrity**

The Badger Pass Ski Area historic site includes a substantial amount of intact and significant features and characteristics from its period of significance. Despite growth and site maintenance, the site continues its recreational use as a downhill and cross-country ski area within Yosemite National Park and its landscape features have undergone few physical changes. Although the Badger Pass Ski Lodge, a significant contributor to the historic site, has diminished architectural integrity due to incompatible post-1953 additions and alterations made to its exterior and interior,

the building does retain sufficient integrity to convey its significance as a contributing feature of the historic site. The expansion of circulation systems has similarly not compromised the overall design and materials of the site.

The site as a whole possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and therefore retains sufficient integrity to convey its significance for the entire period of significance from 1934 to 1953.

**Location:** The Badger Pass Ski Area and all contributing features of the historic site have remained in the same location and configuration within Yosemite National Park since its period of significance (1934 to 1953). Therefore, the property retains integrity of location to convey its historic significance.

**Design:** Since 1953, several features have been added and alterations made to individual contributing features within the historic site. These additions include the installation of new ski lifts and associated equipment, construction of two additional parking loops to allow for increased parking capacity, installation of temporary trailers and buildings to house ski equipment rentals, installation of various non-contributing shelters used to facilitate ski operations and ski school service on the site, and incompatible alterations and additions to the Badger Pass Ski Lodge that have compromised the architectural and structural integrity of the building. Despite these changes, the overall character of the design and layout of the site have not been altered, and the historic site as a whole (fourteen buildings and structures, and circulation systems, as well as natural systems, spatial organization, land use, topography, vegetation, views and vistas, and small-scale features) continues to retain integrity of design to convey its historic significance.

**Setting:** The setting of Badger Pass, including its proximity to Glacier Point Road, its elevation, natural bowl shape, north-facing slopes, scenic vegetation, and protected meadow allowing for accumulation of snowfall, contributed to its selection as a downhill and cross-country skiing area. Although changes have been made to individual contributing features of the site, including buildings and structures, and circulation patterns, these changes do not affect the overall character of the setting of the Badger Pass Ski Area. Therefore, the property retains sufficient integrity of setting to convey its historic significance.

**Materials:** Despite alterations and additions to buildings, structures, and small-scale features, the historic materials of the ski area remain largely intact. Original materials, including wetland, meadow, and forest vegetation; circulation systems; natural systems and features; and associated elements have remained unchanged since the period of significance. The majority of the alterations to the ski lodge were additive in nature and much of the original building materials remain. Therefore, the property retains sufficient integrity of materials to convey its historic significance.

**Workmanship:** Badger Pass was transformed into an aesthetically pleasing and functional winter sports facility from a pristine natural environment. This transformation involved a high level of workmanship, and included the creation of ski runs through grading and manipulation of existing terrain and vegetation, as well as the introduction of buildings, structures, circulation systems, and other necessary facilities to the site. This workmanship remains evident at today, and therefore, the property retains sufficient integrity of workmanship to convey its historic significance.

**Feeling:** The feeling of the Badger Pass Ski Area is characterized by its remote location, its access via the historic Glacier Point Road, and its appearance as a rustic historic ski area. Upon the

establishment of the Badger Pass Ski Area in 1934, the site flourished through the mid-1950s and experienced continual growth into an influential ski area and teaching facility. The ski area today is one of the only downhill ski facilities in the United States located in a national park and continues to experience high levels of visitation in the winter months. Therefore, the property retains sufficient integrity of feeling to convey its historic significance.

**Association:** The Badger Pass Ski Area is associated with the early development of winter sports, recreation, and tourism in Yosemite National Park and the western United States, and its association with these historic contexts is still evident. Therefore, the property retains sufficient integrity of association to convey its historic significance.

## Environmental Consequences - Methodology

The methodology for evaluating effects to historic properties under NHPA is discussed at the beginning of this chapter, on page 3-7.

In accordance with 36 CFR 800 criteria of effect, the Badger Pass Ski Area historic site was analyzed qualitatively, based on modifications that would be made to character-defining features (features that qualify the property for inclusion in the National Register of Historic Places). Phased work outlined was assessed for the potential effect multi-phase construction might have on the historic site and ski lodge. The following actions common to all action alternatives would have an effect on the historic site. Actions specific to individual alternatives that would affect the historic site are described under each alternative, below.

### Elements Common to the Proposed Action Alternatives

The following proposed actions are common to all action alternatives and have the potential to impact the Badger Pass Ski Area historic site. All actions would comply with the Secretary of the Interior's *Standards for the Treatment of Historic Properties (Standards)*.

- Maintain and protect the integrity of the Badger Pass Ski Lodge, a contributing element of the Badger Pass Ski Area historic site, and character-defining features of the Badger Pass Ski Area historic site
- Repair and/or restore ski lodge elements to preserve and enhance the historic character of the ski area, with possible renovation or replacement of non-historic elements in a compatible manner
- Treat critical structural and design deficiencies to prevent further damage due to water infiltration and remove roof and decks
- Address deficiencies in seismic, accessibility, fire, and building codes; eliminate water intrusion; and reduce snow build-ups
- Relocate or replace kitchen and dining facilities to meet health code requirements and improve efficiency
- Replace temporary structures with permanent buildings of compatible construction to maintain continued ski area operations and house current programs
- Maintain ski area service and support functions while protecting the winter recreation visitor experience at Badger Pass Ski Area

## Environmental Consequences of Alternative 1 (No Action)

### Analysis

Under Alternative 1 extant features of the Badger Pass Ski Area historic site would remain and would continue to receive the current level of maintenance and upkeep. The potential for an adverse effect under Alternative 1 exists if the historic site and/or the ski lodge, a contributor, suffer from degraded conditions of site features, which would threaten and diminish the integrity of the NRHP-eligible site. Within the historic site of the Badger Pass Ski Area, only the buildings and structures are currently in a degraded or poor condition, thus the only potential for adverse effect on historic site features would be if further structural and other deterioration and/or removal and loss of character-defining features of the ski lodge occurs.

While the No Action Alternative has the potential to create an adverse effect if the integrity of the ski lodge, and its ability to represent its significant associations individually and within the historic site, is diminished and/or deteriorated, current maintenance and upkeep strategies are capable of maintaining the existing state of the building and its features, resulting in effects that are not adverse.

**Conclusion:** Under Alternative 1, regular maintenance and upkeep of the historic site would continue to occur. As the No Action Alternative would not alter, directly or indirectly, any of the characteristics of the historic site that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, Alternative 1 would have no adverse effect.

### Cumulative Impacts

Past projects in the ski area that have been evaluated in conjunction with the impacts of proposed action alternatives include: Bruin, Badger, and Eagle ski lift replacement, life/safety shoring of ski lodge decking, remodel of ski lodge ground floor food service, ski lodge lower deck repair, rental shop demolition and site restoration, terrain park relocation, ski lodge emergency stabilization measures, Snowflake Room food service reactivation, temporary modular rental shop installation, and ski lodge upper deck repair. Present and foreseeable actions in the ski area reviewed include: interpretive display, rehabilitation of Glacier Point Road, remediation of soil contamination, and the Scenic Vista Management Plan. There is no potential for adverse effect to the historic site or the ski lodge, a contributor, under Alternative 1 and thus there is no contribution to any cumulative impact by Alternative 1. Upon review of these past, present, and reasonably foreseeable actions, these projects and Alternative 1 would not have a cumulative adverse effect on the historic site.

### Impairment

Characteristics that make the property eligible for inclusion in the National Register of Historic Places would not be altered in a way that would diminish the integrity of the property. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, Alternative 1 would not impair park historic properties.

## Environmental Consequences of Alternative 2

### Analysis

Alternative 2 would better halt the deterioration of features and materials significant to the historic site, when compared to Alternative 1. In addition to the general maintenance and upkeep currently performed in the ski area and proposed in Alternative 1, Alternative 2 would allow for greater protection from water-intrusion and material deterioration. Significant character-defining features

and existing spatial relationships would be maintained and protected, though no long-term comprehensive preservation strategy is proposed.

All work proposed in Alternative 2 would be *Standards*-compliant, including: the replacement of roofing materials and use of a new roof ice melt system at specific locations, replacement of the second floor deck, railings and exterior stair, and replacement of the south glazing wall. The removal, repair, and salvage of the ski lodge's exterior half-log cladding, to be re-applied over a new wall membrane and repaired sheathing, would also be *Standards*-compliant. Other work, such as the installation of three stop elevators and the connection of the lobby and corridors can be performed with little harm to character-defining spaces, features, or materials. Much of the work in Alternative 2 has the potential to maintain, protect, and preserve character-defining features and materials while also improving occupant and visitor circulation and experience, maintaining and potentially improving the vitality of the historic site and its significant associations.

Design and construction planning would provide that there would be no adverse effect on character-defining and/or contributing features of the historic site from ADA and civil/fire-protection improvements to platforms, walkways, ramps, and the entry drive, and replacement of stair access and ramp to ski slopes. Replacement of the concrete entry walkway and entry drive to improve surface drainage, as well as use of an exterior perimeter drainage system at the eastern and southern edge of the ski lodge, would allow water infiltration issues to be abated, an action that has the potential to better repair, protect, and preserve the historic site and the ski lodge.

New permanent structures constructed to replace the existing temporary Nordic and Alpine rental buildings would be *Standards*-compliant, designed and constructed in a compatible manner with the existing lodge, and would not block important historic vistas, obstruct historic circulation routes or interfere with character defining elements of the site's spatial organization. Therefore, these new structures would have no adverse effect on the historic site.

Design and construction would provide that the proposed work would not have an adverse effect on significant vistas and views, particularly to and from the ski lodge and the ski runs and surrounding landscape, as the condition of the site in terms of the building envelope/footprints as well as the features of the ski lodge would remain largely unaltered from their existing state.

All work proposed in Alternative 2 would have no adverse effect on the historic site or the ski lodge, as design and construction would be conducted in a manner that would avoid adverse effects to the historic site. During the course of rehabilitation and system upgrade work throughout the historic site and particularly during tasks related to rehabilitating the exterior and interior of the ski lodge, there is a potential that original features and materials obscured by previous alterations might be uncovered and exposed. All work to known or recovered character-defining features would be *Standards*-compliant to avoid the potential for an adverse effect on the historic site and ski lodge.

With the proposed rehabilitation and new construction under all action alternatives, there would be an opportunity to utilize materials with recycled content and to introduce elements of sustainability further in systems upgrades. The introduction and implementation of sustainable strategies in all action alternatives would not affect the ability for the rehabilitation proposed to be *Standards*-compliant. All materials to be introduced into the historic site and in particular on the exterior and interior of the ski lodge and new construction would be compatible with the character-defining features and materials of the NRHP-eligible site.

**Conclusion:** Alternative 2 proposes a *Standards*-compliant rehabilitation program for the ski lodge that includes new construction, abatement of structural, weather envelope, life-safety, and mechanical systems upgrades, as well as improved ADA accessibility and use of the ski lodge and its spaces. The proposed activities would not alter, directly or indirectly, any of the characteristics of the historic site that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Therefore, Alternative 2 would have no adverse effect.

### **Cumulative Impacts**

Past projects in the ski area that have been evaluated in conjunction with the impacts of proposed action alternatives include: Badger, Bruin and Eagle ski lift replacement, life/safety shoring of ski lodge decking, remodel of ski lodge ground floor food service, ski lodge lower deck repair, rental shop demolition and site restoration, terrain park relocation, ski lodge emergency stabilization measures, Snowflake Room food service reactivation, temporary modular rental shop installation, and ski lodge upper deck repair. Present and foreseeable actions in the ski area reviewed include: interpretive display, rehabilitation of Glacier Point Road, mitigation of soil contamination, and the Scenic Vista Management Plan. There is no potential for adverse effect to the historic site or the ski lodge, a contributor, under Alternative 2, and thus there is no contribution to any cumulative impact by Alternative 2. Upon review of these past, present, and reasonably foreseeable actions, these projects and Alternative 2 are not expected to have a cumulative adverse effect on the historic site.

### **Impairment**

Characteristics that make the property eligible for inclusion in the National Register of Historic Places would not be altered in a way that would diminish the integrity of the property. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, Alternative 2 would not impair park historic properties.

## **Environmental Consequences of Alternative 3**

### **Analysis**

Alternative 3 would more substantially rehabilitate features and materials significant to the historic site, when compared to Alternative 2. The character of the ski lodge would be better protected and improved, with existing character-defining features maintained, strengthened, and made a focus of the scheme in the freeing of the ski lodge from adjoining non-historic construction and reveal the pure lines of the roof and west façade. Substantial rehabilitation goals on the interior include installing a fireplace and hearth to restore the fireplace and its surround panels, remodeling the kitchen, loading and storage areas, relocating the food serving area, removing existing stair and providing new interior stair to second floor break room, removing and replacing second floor bar and food service, and relocating the Winter Club room.

Significant spatial relationship and site view corridors would be enhanced by clearing building construction that obstructed views to and from the ski lodge. A primary improvement of Alternative 3 would be establishing a sense of arrival to the ski lodge. The buildings would have frontage to the street, providing points of service and direct flow, and yet would be designed to provide a greater visual presence of the historic ski lodge upon entry. The ski lodge rooflines and overhangs would be distinctly visible and prominent from both the north and south perspectives. New construction would be of design character compatible with and subservient to the ski lodge.

The building footprint would be kept roughly to the existing footprint with minimal alteration to site features and no impact on significant character-defining features of the site.

All work proposed in Alternative 3 would be *Standards*-compliant, and would include: the replacement of roofing materials and use of a new roof ice melt system at specific locations, replacement of the second floor deck, railings and exterior stair, and of the south glazed wall. The removal to repair and salvage the ski lodge's exterior half-log cladding, to be set back into place over a new wall membrane and repaired sheathing, would also be *Standards*-compliant. Much of the work in Alternative 3 has the potential to maintain, protect, and preserve character-defining features and materials while also improving occupant and visitor circulation and experience, maintaining and potentially improving the vitality of the historic site and its significant associations.

All work proposed in Alternative 3 would have no adverse effect on the historic site or the ski lodge, as design and construction would be conducted in a manner that would avoid adverse effects to the historic site. Design and construction planning would provide that there would be no adverse effect on character-defining and/or contributing features of the historic site from ADA and civil/fire-protection improvements to platforms, walkways, ramps, and the entry drive, and replacement of stair access and ramp to ski slopes. Replacement of the concrete entry walkway and entry drive to improve surface drainage, as well as use of an exterior perimeter drainage system at the eastern and southern edge of the ski lodge, would allow water infiltration issues to be abated, an action that has the potential to better repair, protect, and preserve the historic site and the ski lodge.

New permanent structures constructed to replace the existing temporary Nordic and Alpine rental buildings would be *Standards*-compliant, designed and constructed in a compatible manner with the existing lodge, and would not block important historic vistas, obstruct historic circulation routes or interfere with character defining elements of the site's spatial organization. Therefore, these new structures would have no adverse effect on the historic site.

Design and construction would provide that the proposed work would not have an adverse effect on significant vistas and views, particularly to and from the ski lodge and the ski runs and surrounding landscape, as the condition of the site in terms of the building envelope/footprints would improve, allowing for a partial restoration of the original view of the lodge through the separation of the historic building from non-contributing additions made post-1953.

With the proposed rehabilitation and new construction under all action alternatives, there would be an opportunity to utilize materials with recycled content and to introduce elements of sustainability further in systems upgrades. The introduction and implementation of sustainable strategies in all action alternatives would not affect the ability for the rehabilitation proposed to be *Standards*-compliant. All materials to be introduced into the historic site and in particular on the exterior and interior of the ski lodge and new construction would be compatible with the character-defining features and materials of the NRHP-eligible site.

During the course of rehabilitation and system upgrade work throughout the historic site and particularly during tasks related to rehabilitating the exterior and interior of the ski lodge, there is a potential that original features and materials obscured by previous alterations might be uncovered and exposed. All work to known or recovered character-defining features would be *Standards*-compliant to avoid the potential for an adverse effect on the historic site and ski lodge.

**Conclusion:** Alternative 3 presents a higher attainment of the overall rehabilitation of the ski lodge than what is proposed in Alternative 2, allowing for *Standards*-compliant rehabilitation and protection of contributing features within the historic site. Beyond the proposed abatement of structural, weather envelope, life-safety, and mechanical systems issues, as well as improved ADA accessibility, this alternative further considers the need to distinguish the ski lodge as a significant and primary contributing feature of the NRHP-eligible historic site. The proposed activities would not alter, directly or indirectly, any of the characteristics of the historic site that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Therefore, Alternative 3 would have no adverse effect.

### **Cumulative Impacts**

Past projects in the ski area that have been evaluated in conjunction with the impacts of proposed action alternatives include: Badger, Bruin and Eagle lift replacement, life/safety shoring of ski lodge decking, remodel of ski lodge ground floor food service, ski lodge lower deck repair, rental shop demolition and site restoration, terrain park relocation, ski lodge emergency stabilization measures, Snowflake Room food service reactivation, temporary modular rental shop installation, and ski lodge upper deck repair. Present and foreseeable actions in the ski area reviewed include: interpretive display, rehabilitation of Glacier Point Road, remediation of soil contamination, and the Scenic Vista Management Plan. There is no potential for adverse effect to the historic site or the ski lodge, a contributor, under Alternative 3, thus there is no contribution to any cumulative impact by Alternative 3. Upon review of these past, present, and reasonably foreseeable actions, these projects and Alternative 3 are not expected to have a cumulative adverse effect on the historic site.

### **Impairment**

Characteristics that make the property eligible for inclusion in the National Register of Historic Places would not be altered in a way that would diminish the integrity of the property. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, Alternative 3 would not impair park historic properties.

## **Environmental Consequences of Alternative 4**

### **Analysis**

In this optimal approach to historic rehabilitation, the highest integrity of the ski lodge would be restored to prominence. All primary character-defining features would be restored, while the ski lodge would be freed visually and physically from adjoining non-historic construction. Construction dating from after the historic period of significance would be removed, including the second floor deck and south glazed dining room at the ski lodge. The south façade would be restored to its original appearance, as are all elevations, to better reflect their condition during the period of significance.

Alternative 4 would remove adjoining non-contributing construction west and south of the ski lodge and reestablish the original ski lodge roofline and all elevations. New construction both east and west of the ski lodge would incorporate ski operations and visitor services in an efficient manner responsive to site parameters, while also being compatible with yet distinguishable from the ski lodge. The building footprint would be kept roughly at the existing footprint, with the exception of a small portion of the Alpine rental building, with minimal alteration to site features and no impact on significant character-defining features of the site. Important spatial relationships

and site view corridors would be enhanced with these improvements, with the clearing of all building construction obstructing views to and from the ski lodge.

All work proposed in Alternative 4 would be *Standards*-compliant, and would include: code upgrades and repairs and replacement of systems, modification to exterior plazas and decks and roadside plazas and paving, the installation of a new fireplace and hearth to reintroduce a unique historic feel and charm to the lodge, removal of the south glazed wall, restoration of the interior lounge and its direct relationship to the deck and views to ski slopes, restoration of the south façade with a second floor balcony, and removal of an exterior stair and new interior stair to second floor office, removal of second floor bar and food service and relocation of Winter Club room, removal of the West Building and replacement of the temporary Alpine and Nordic Rental buildings with permanent construction (East Building and Nordic Center). Through these changes, the building would be extensively rehabilitated and partially restored, and its original function as a meeting/gathering space would be restored, allowing the building to function while being more compatible with its original use.

Design and construction of work under Alternative 4 would be conducted in a manner that would have no adverse effect to the historic site. Design and construction planning would provide that there would be no adverse effect on character-defining and/or contributing features of the historic site from ADA and civil/fire-protection improvements to platforms, walkways, ramps, and the entry drive, and replacement of stair access and ramp to ski slopes. Replacement of the concrete entry walkway and entry drive to improve surface drainage, as well as use of an exterior perimeter drainage system at the eastern and southern edge of the ski lodge, would allow water infiltration issues to be abated, an action that has the potential to better repair, protect, and preserve the historic site and the ski lodge.

New permanent structures constructed to replace the existing temporary Nordic and Alpine rental buildings would be *Standards*-compliant, designed and constructed in a compatible manner with the existing lodge, and would not block important historic vistas, obstruct historic circulation routes or interfere with character defining elements of the site's spatial organization. Therefore, these new structures would have no adverse effect on the historic site.

Proposed work would not have an adverse effect on significant vistas and views, particularly to and from the ski lodge and the ski runs and surrounding landscape, as the condition of the site in terms of the building envelope/footprints would improve, allowing for a partial restoration of the original view of the lodge through the separation of the historic building from non-contributing additions made post-1953.

With the proposed rehabilitation and new construction under all action alternatives, there would be an opportunity to utilize materials with recycled content and to introduce elements of sustainability further in systems upgrades. The introduction and implementation of sustainable strategies in all action alternatives would not affect the ability for the rehabilitation proposed to be *Standards*-compliant. All materials to be introduced into the historic site and in particular on the exterior and interior of the ski lodge and new construction would be considered for compatibility with the character-defining features and materials of the NRHP-eligible site.

During the course of rehabilitation and system upgrade work throughout the historic site and particularly during tasks related to rehabilitating the exterior and interior of the ski lodge, there is a potential that original features and materials obscured by previous alterations might be uncovered

and exposed. All work to known or recovered character-defining features would be *Standards*-compliant to avoid the potential for an adverse effect on the historic site and ski lodge.

**Conclusion:** Alternative 4 achieves the highest level of the overall rehabilitation goals for the ski lodge, allowing for *Standards*-compliant rehabilitation and protection of contributing features within the historic site. Beyond the proposed abatement of structural, weather envelope, life-safety, and mechanical systems, as well as improved ADA accessibility, this alternative goes further than Alternatives 2 and 3 to distinguish the ski lodge as a significant and primary contributing feature of the NRHP-eligible historic site. The proposed activities would not alter, directly or indirectly, any of the characteristics of the historic site that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Therefore, Alternative 4 would have no adverse effect.

### **Cumulative Impacts**

Past projects in the ski area that have been evaluated in conjunction with the impacts of proposed action alternatives include: Badger, Bruin, and Eagle ski lift replacement, life/safety shoring of ski lodge decking, remodel of ski lodge ground floor food service, ski lodge lower deck repair, rental shop demolition and site restoration, terrain park relocation, ski lodge emergency stabilization measures, Snowflake Room food service reactivation, temporary modular rental shop installation, and ski lodge upper deck repair. Present and foreseeable actions in the ski area reviewed include: interpretive display, rehabilitation of Glacier Point Road, remediation of soil contamination, and the Scenic Vista Management Plan. There is no potential for adverse effect to the historic site or the ski lodge, a contributor, under Alternative 4, thus there is no contribution to any cumulative impact by Alternative 4. Upon review of these past, present, and reasonably foreseeable actions, these projects and Alternative 4 are not expected to have a cumulative adverse effect on the historic site.

### **Impairment**

Characteristics that make the property eligible for inclusion in the National Register of Historic Places would not be altered in a way that would diminish the integrity of the property. Because no resources specific to the park's purpose would be affected, and there would be no change to the natural and cultural integrity of the park, Alternative 4 would not impair park historic properties.