National Park Service
U.S. Department of the Interior
Grand Teton National Park
Moose, Wyoming

Jenny Lake Renewal Plan
Environmental Assessment

February 2014

Jenny Lake Renewal Plan

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Summary

Grand Teton National Park is proposing to renovate trails and facilities in four major use zones in the Jenny Lake area. The purpose of the Jenny Lake Renewal Plan is to create a master plan for the Jenny Lake area that will provide a safe, environmentally sensitive, and enhanced visitor experience. The plan would restore the backcountry areas of the Jenny Lake trail system, including Inspiration Point and Hidden Falls overlooks, and make improvements in the frontcountry areas of the South Jenny Lake developed area, Jenny Lake Overlook, and String Lake Outlet. The plan is needed to address several conditions at these key areas including: aging and/or poorly designed trails and walkways that do not meet current trail standards, including inadequate access for people with disabilities; confusing frontcountry and backcountry trail systems; aging and failing bridges; user-created trails causing resource degradation; limited self-guided interpretation/orientation; compacted soils and bare ground in destination areas; and outdated and undersized water and wastewater systems and restrooms.

This Environmental Assessment (EA) evaluates two alternatives: a no action alternative and an action alternative. The no action alternative describes the current conditions without renewal activities taking place and the action alternative addresses proposed renewal and renovation activities in the Jenny Lake area.

This EA has been prepared in compliance with the National Environmental Policy Act to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet the objectives of the proposal; 2) evaluates potential issues and impacts to the park's resources and values; and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics analyzed in this document, whose resultant impacts may be greater than minor, consist of: cultural resources including historic structures and cultural landscapes, ethnographic resources, and archeological resources; geologic resources and vegetation; wildlife, including special status species; wilderness; natural soundscapes; visitor experience; and park operations. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document and comments were considered in the project proposal and analysis.

Public Comment

If you wish to comment on the EA, you may post comments online at http://parkplanning.nps.gov/jennylake or mail comments to:

Superintendent, Attn: Jenny Lake Renewal Plan EA, Grand Teton National Park, PO Drawer 170, Moose, WY 83012-0170.

This EA will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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ACRONYMS

ABAAS	Architectural Barriers Act Accessibility Standards
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BMP	Best Management Practice
CBA	Choosing by Advantages
CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
DO	Director's Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
LF	linear feet
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
PCE	Programmatic Categorical Exclusion
PEPC	Planning, Environment, and Public Comment
SHPO	State Historic Preservation Office
USFWS	U.S. Fish and Wildlife Service
VA	Value Analysis
WGFD	Wyoming Game and Fish Department
WYDEQ	Wyoming Department of Environmental Quality

PURPOSE AND NEED

Introduction

Grand Teton National Park is located 5 miles north of the town of Jackson, Wyoming, and is managed by the National Park Service (NPS). The current park was created in 1950 when the original 1929 park boundaries were combined with those of the Jackson Hole National Monument. The approximately 310,000 acres of the park were set aside as part of the National Park System to: 1) preserve and protect the spectacular scenery of the Teton Range and the valley of Jackson Hole; 2) protect a unique geologic landscape that supports abundant diverse native plants and animals and associated cultural resources; 3) protect wildlands and wildlife habitat within the Greater Yellowstone Area, including the migration route of the Jackson elk herd; and 4) provide recreational, educational, and scientific opportunities compatible with these resources, for enjoyment and inspiration.

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations (40 CFR §1508.9), and NPS Director's Order (DO) 12, Conservation Planning, Environmental Impact Analysis, and Decision-Making. The purpose of this EA is to examine the environmental impacts associated with the proposal to renovate trails and facilities in the Jenny Lake area. The project's scope encompasses two discrete and definable components of the Jenny Lake area – the frontcountry and the backcountry. The frontcountry effort encompasses the South Jenny Lake developed area, extending along the shoreline west to the public boat launch. To the east, the project area extends to the Jenny Lake Campground. The frontcountry also includes the Jenny Lake Overlook along the one-way scenic loop and the String Lake Outlet trailhead area. The backcountry effort encompasses all areas west of the public boat launch on South Jenny Lake around the lake to Hidden Falls and Inspiration Point. It also includes the west boat dock, the Hidden Falls/Inspiration Point viewing areas, and associated trails in this area.

Background

Each year, people from around the world visit Grand Teton National Park to experience its stunning scenery, incredible hiking, unsurpassed geology, and extraordinary wildlife. With 70 percent of park visitors arriving at the historic Jenny Lake area, it is one of the most popular day-use areas in the park, attracting approximately 1.8 million park visitors each year. Situated at the base of the majestic Teton Range, Jenny Lake is located approximately 16 miles north of Grand Teton National Park's southern boundary (Figure 1). Both visitor information and services are provided in the Jenny Lake area in addition to access to numerous trails and Jenny Lake itself.

The trails in the area provide abundant opportunities for hiking along the valley floor as well as more strenuous hikes into the park's backcountry. The project area on the west side of Jenny Lake is in an area of recommended wilderness. The recommendation that the area be officially designated as wilderness was transmitted to Congress in 1978. The NPS is directed to manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. By NPS policy, park lands that contain recommended wilderness must be managed in the same manner as designated wilderness to preserve the wilderness character of the area.

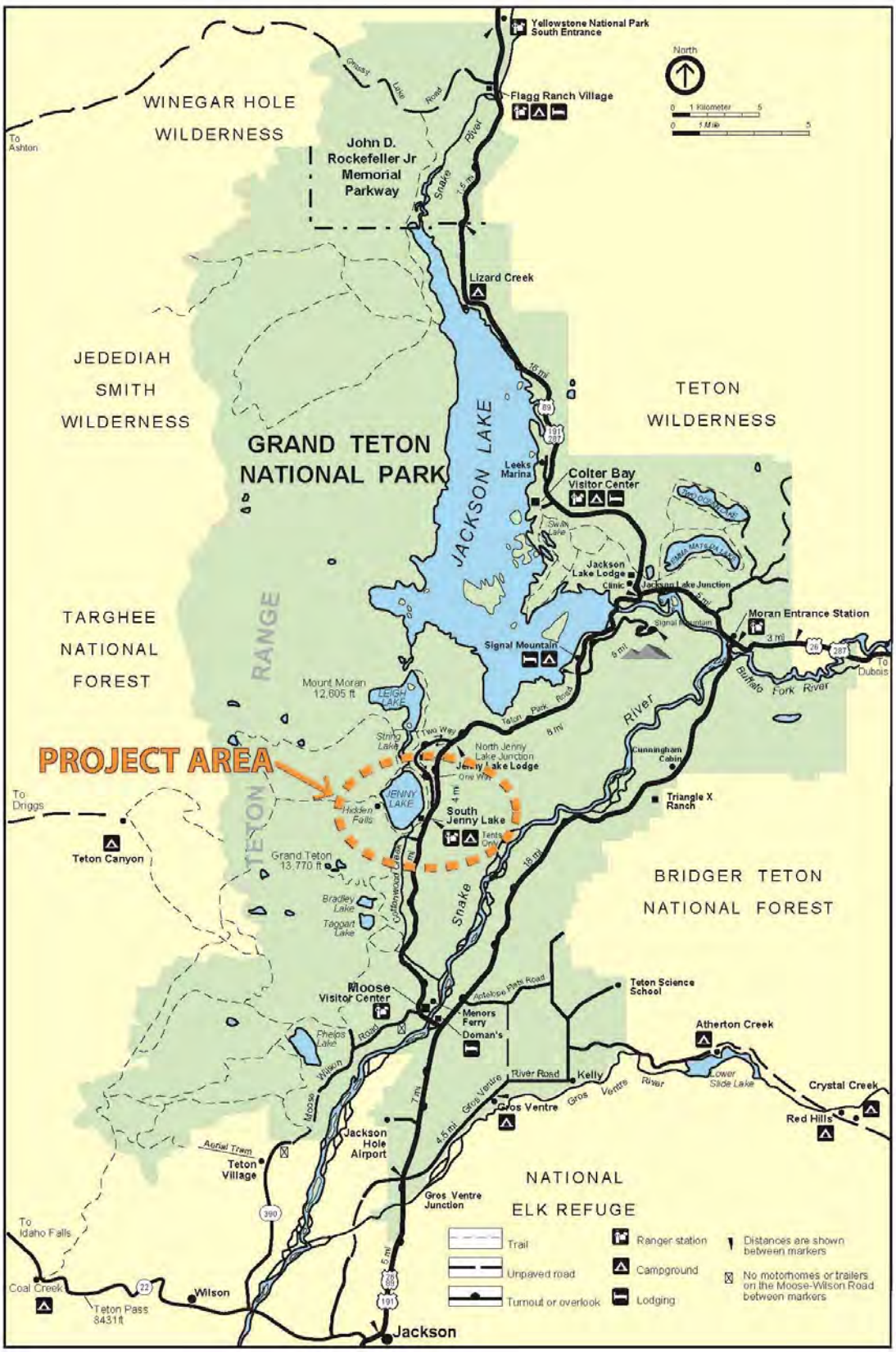

Figure 1. Project Location.

The area around Jenny Lake has a rich cultural history that dates back thousands of years, originating with Native Americans. Europeans first came to the area in the early 1800s for fur trading, beginning around the time of the explorations of Lewis and Clark in 1804-1806 and ending around 1840. Homesteading in Jackson Hole occurred prior to 1900, but experienced slow growth until dude ranching and other outdoor recreation activities became popular in the early 1900s. Recreational structures have been present in the Jenny Lake area even prior to the establishment of Grand Teton National Park in 1929. Currently three properties located in the Jenny Lake area are listed in the National Register of Historic Places (NRHP): Jenny Lake Boat Concession Facilities, the Jenny Lake Civilian Conservation Corps (CCC) Camp, and the Jenny Lake Ranger Station. These three areas contain eight structures/properties. Portions of the trail are also considered historic, but they have not been officially documented as such. Most of the historic resources that remain at Jenny Lake reflect the area's traditional importance as a scenic attraction and recreation center in the park (NPS 1977).

On November 12, 1973, a severe windstorm struck the south Jenny Lake area, destroying thousands of trees and exposing many of the facilities. The loss of trees severely affected the character of the site. The conditions at the time prompted NPS to reevaluate the area's use patterns and levels of development. The frontcountry of the Jenny Lake area of Grand Teton National Park was redeveloped in the late 1970s in accordance with the 1977 Jenny Lake Development Concept Plan (NPS 1977). That planning effort was initiated to define major problems and to provide means to alleviate them in order to ensure that uses of the Jenny Lake area did not degrade the natural environment. The work was intended to alleviate the problems of traffic congestion, inadequate parking, visual intrusions, physical condition and appearance of certain facilities, and general overuse of the area.

Another effort to further improve frontcountry conditions in the Jenny Lake area was undertaken in the early 1990s. The Teton Corridor Moose to North Jenny Lake Development Concept Plan/Environmental Assessment (NPS 1990a) provided the NPS with direction for long range management, development, and use of the Teton Corridor from Moose Junction to North Jenny Lake Junction. The plan responded to needs to reorganize visitor services, facilities, park operations, circulation, and housing within the corridor while preserving as many historic structures as possible (NPS 1990a). The proposal called for the modification of the Jenny Lake area to support a higher concentration of visitors and for the removal of intrusive roads and structures from the lakeshore and other improvements intended to support visitor services and help preserve park resources. As part of this plan a number of buildings were relocated and the Jenny Lake public boat launch and parking were formalized.

For decades, visitors to frontcountry and backcountry areas around Jenny Lake have gathered in limited use areas and on narrow trails, creating crowding and severe deterioration of the main trail corridors and overlooks. In many areas, the trails were built in the 1930s and were not designed to accommodate today's large number of visitors. Examples of issues in the project area include: poor drainage and steep pitches resulting in continuous erosion; overcrowding on trails and viewing areas resulting in trampled vegetation and bare ground; challenging route-finding; and very limited interpretation of the rich cultural and natural history. These conditions substantially reduce the quality of visitor experience as well as degrade the resources.

While past planning efforts provided for some of the site's needs, significant opportunities exist to improve the experience, ultimately conveying to the millions of annual park visitors the importance of protecting and preserving places of natural beauty. Aside from emergency repairs to backcountry bridges and trail structures, improvements have been primarily frontcountry focused. The Jenny Lake Renewal Plan allows the backcountry of the Jenny Lake area to receive much needed attention and still provides for considerable improvements to the frontcountry, including needed upgrades to the water and wastewater systems. The key use areas to be addressed in the plan are linked by the Jenny Lake Loop Trail system (Figure 2). As described above, these key use areas can be categorized into either "frontcountry" or "backcountry."

Work in the frontcountry use areas (including South Jenny Lake, String Lake Outlet, and Jenny Lake Overlook) would include improvements to developed elements such as restrooms, interpretive signs, paved trails and overlooks, and picnic tables. In contrast, a "less is more" approach would generally be taken in the backcountry, where minimal development currently exists. In these backcountry areas, improvements would be made primarily for resource protection and visitor safety.

Purpose and Need

Due to the popularity and high visitation of the Jenny Lake area, park managers developed the following goals specifically for the Jenny Lake frontcountry and backcountry.

Frontcountry

Interpretation:

- Visitors to South Jenny Lake will be immersed in an interpretive experience that highlights the place, people, and preservation stories that make this area such a unique and magnificent destination. Interpretive elements reach visitors of varied abilities and learning styles through experiences that engage them to think, interact, and feel a connection with Jenny Lake and Grand Teton National Park.
- South Jenny Lake will provide appropriate route-finding, orientation, trip planning, and safety information that will assist all visitors as they explore Jenny Lake and other areas of the park.

Visitor Experience:

- Jenny Lake will continue to be the gateway to a wide range of spectacular outdoor recreation opportunities that include accessible trails throughout South Jenny Lake; bicycling on the multi-use pathway; and swimming, fishing, and boating in or on Jenny Lake.
- The Jenny Lake area will continue to provide mountain, glacial lake, and woodland area views for all visitors to appreciate the outstanding scenery and wildlife.

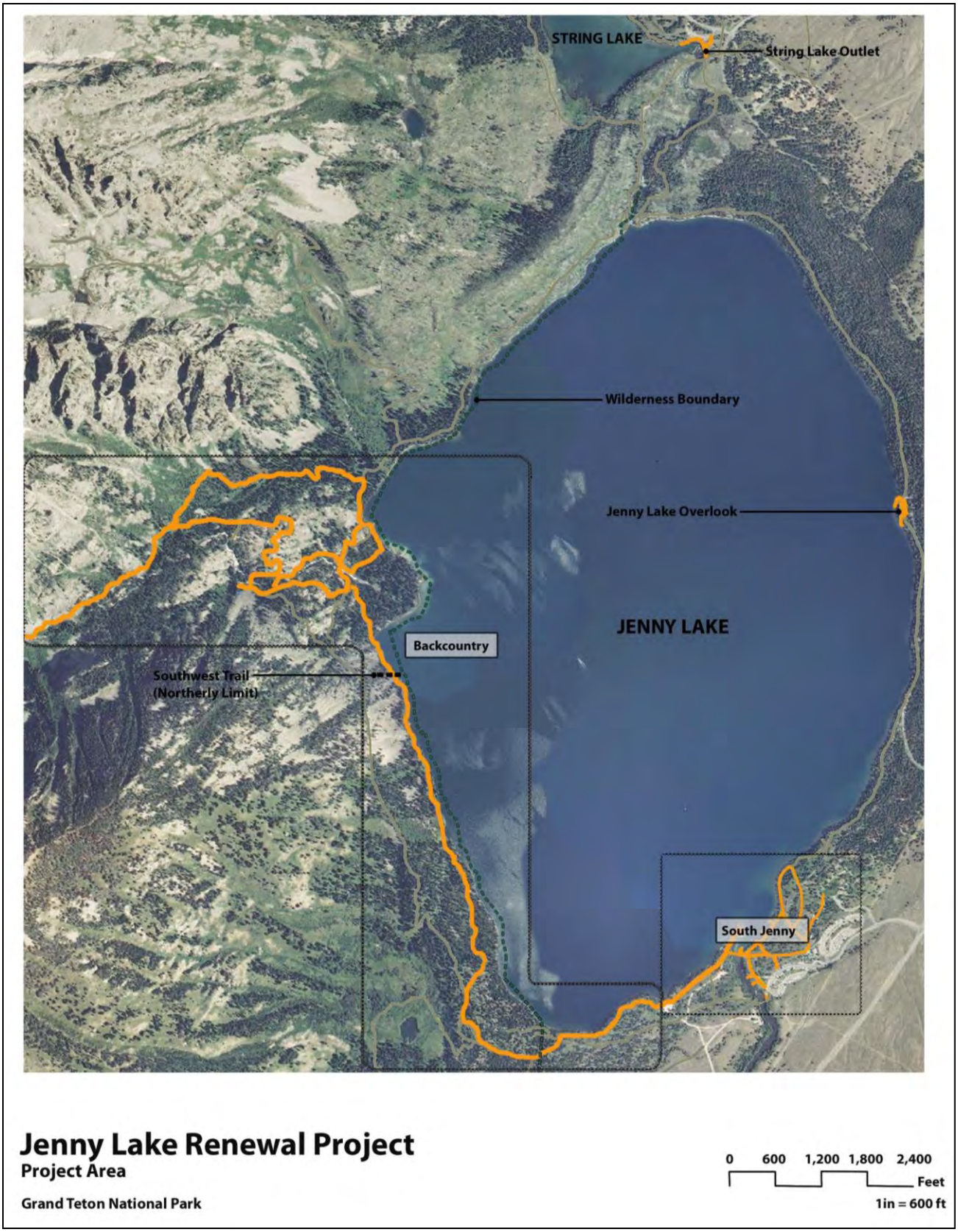

Figure 2. Project Area.

Facilities and Services:

- Accessible facilities and services will be provided at South Jenny Lake to accommodate current levels of visitors. Increases in current visitation levels will be supported with visitor use and resource studies.
- Trails and interpretive media will reflect the historic character of the Jenny Lake area and tie together the Jenny Lake Ranger Station, Jenny Lake Boat Concession Facilities, and the Jenny Lake CCC Camp historic districts seamlessly with common themes.
- Visitors will enjoy the use of safe, efficient, and sustainable utilities (including water, wastewater, electricity, and solid waste removal) that meet the needs of the Jenny Lake area.
- Campground and picnic area facilities will be designed and maintained so that they are safe, efficient, and sustainable.
- Commercial services will be provided to enhance visitor experience and meet basic needs, such as gift, souvenir, and simple food and beverage items.

Resource Protection:

- Park managers will identify, evaluate, protect, and preserve the natural and cultural resources in the Jenny Lake area and provide for the public's enjoyment and understanding of these resources.
- The Jenny Lake area will accommodate the current level of frontcountry visitors, with minimum impact to natural and cultural resources.
- Jenny Lake frontcountry pathways and trails will be practical and intuitive, reducing the formation of user-created trails.

Backcountry (Recommended Wilderness)

Interpretation:

- Jenny Lake interpretive programs will provide visitors with varied experiences focusing on the major interpretive themes of the park, promoting and perpetuating public awareness of and appreciation for wilderness character, resources, and ethics.

Visitor Experience:

- Hidden Falls and Inspiration Point and their connected trails will continue to be managed for high visitor use so many people can experience an outstandingly scenic natural area without harming park resources.
- Hikers, campers, and stock users will have the opportunity to travel through the backcountry on safe and sustainable trails.

Facilities and Services:

- In the recommended wilderness near Jenny Lake, trails and infrastructure will be limited to only those facilities necessary to protect resources while providing opportunities for visitors to experience wilderness.
- Future visitation levels will be supported with visitor use and resource studies.

Resource Protection:

- The recommended wilderness near Jenny Lake will provide for the current level of backcountry visitors, with minimum impact to natural and cultural resources.
- Trail design will be practical and intuitive, reducing the formation of user-created trails. Redundant trails and bare ground areas will be restored to a natural state.

Wilderness:

- Recognizing that the Jenny Lake backcountry is a high-use wilderness area, the park will encourage and facilitate existing recreational uses that are in keeping with the definitions and purposes of wilderness and do not further degrade the resources and character.

The purpose of the Jenny Lake Renewal Plan is to create a master plan for the Jenny Lake area that will assist in meeting the Jenny Lake management goals and create a safe, environmentally sensitive, and enhanced visitor experience. Renovation of the frontcountry and backcountry areas of Jenny Lake would be sustainable and durable for decades, and of a quality, scale, and character that complements this historic and spectacular area, protects park resources, and elevates visitor experiences. Overall, the project aims to provide a transformative visitor experience - one that creates connections for visitors to the area and ultimately fosters a sense of wilderness stewardship. The plan focuses on the Jenny Lake trail system, including the Inspiration Point and Hidden Falls overlooks (backcountry), the South Jenny Lake developed area, Jenny Lake Overlook, and String Lake Outlet (frontcountry).

The Jenny Lake Renewal Plan is needed to guide the future management and development of the backcountry of Jenny Lake, while specifically addressing the following: trails that do not meet current trail standards; confusing trail junctions and user-created trails; trail drainage problems causing serious erosion and resource degradation; rugged trail conditions; aging backcountry bridges; and compacted soil and bare ground in destination areas. Details are provided in the *Existing Conditions* section below.

Existing Conditions

Frontcountry

Accessibility

Most parking lots, wayside exhibits, and overlooks within the project area have curb cuts and accessible designated parking that are fully compliant with the Architectural Barriers Act Accessibility Standards (ABAAS). In addition, the multi-use pathway from South Jenny Lake to the town of Jackson is ABAAS compliant.

In the South Jenny Lake developed area, walkways leading from the parking lots and 0.33 miles of trails are accessible for persons with disabilities, with asphalt surfaces and appropriate grades. The total trail infrastructure at South Jenny Lake from the boat dock to the campground is 1.55 miles. In many areas, compliant segments are isolated because the approach is non-accessible. For example, while the concessioner boat dock is accessible, the trail from the visitor services area to the boat dock has an 8.5 percent grade (which is too steep) and the Lake Walk Trail along the east side of the lake has segments that are 18 percent grade; therefore, with no other options available, there are no meaningful ABAAS accessible routes to the lake's edge.

Due to the age and design of the facilities in the South Jenny Lake area, several need modifications to make them ABAAS compliant. The restrooms in South Jenny Lake are only

partially compliant, with stalls that are too narrow. The Jenny Lake Visitor Center has an accessible route to the visitor center, but needs another ramp opposing it to be fully compliant. Self-guided interpretive experiences generally do not meet ABAAS guidelines because they do not accommodate visitors of all abilities.

Interpretation/Orientation

There are several entrances to the South Jenny Lake developed area, but there is no intuitive entrance to welcome and orient visitors. The lack of a clear entrance often results in visitors walking to the back of the Jenny Lake Visitor Center and Jenny Lake Store. Additionally, once in the primary visitor service area, visitors becoming disoriented and confused as they try to find the lake or other key points of interest because there are few route-finding and trip planning tools. Further, the lack of orientation and route-finding signs results in the creation of user-created trails and other resource impacts.

There is minimal and inadequate visitor information beyond what is available inside the Jenny Lake Visitor Center. Because this center is the only interpretive element at Jenny Lake it is not adequate for the existing numbers of visitors.

The current interpretive displays do not communicate key interpretive messages for a broad range of people; they are missing elements regarding visitor options and safety, as well as the rich history of the Jenny Lake area and the recommended wilderness it provides access to.

Scenic Resources

From South Jenny Lake the primary viewsheds are natural; therefore, the built structures often stand out in contrast to the natural scenery. In several areas, there is a mix of administrative fixtures (fuel tanks, etc.) within the scenic viewshed that could be relocated elsewhere.

Facilities and Trails

In the developed area, seating, picnic tables, and shade are limited. In addition, there are not enough restroom facilities for current use, causing extremely long lines during peak periods. At peak times, the lines can take longer than 30 minutes.

There is an extensive network of pedestrian pathways between the parking lots, visitor facilities, backcountry trails, campground, and the lake. The confusing and redundant designated trails have crumbling asphalt and deteriorating retaining walls and are in need of repair. Since there is limited designated access to lake views and the water, erosion and compacted and denuded soils have created undesirable trailside conditions and degradation of natural resources. User-created connecting trails have developed over the years and contribute to the confusing pedestrian experience throughout the area. With the confusing trail junctions, poorly designed trailheads, and user-created trails, route-finding can be difficult.

There is crowding at the concessioner boat dock during the summer season. On the east boat dock, congestion exacerbates visitor confusion as passengers queuing for the concessioner boat obstruct or block the bridge connecting to the backcountry trail system. Crowding in this area is exacerbated because many visitors are unaware of options to get to the other side of the lake besides the boat ride (i.e., 2-mile hike around the lake).

Water/Wastewater

While previous efforts improved conditions at South Jenny Lake by moving buildings and parking areas away from the lake and formalizing the Jenny Lake Public Boat Launch and

parking area, they did not address the water and wastewater systems. A large portion of the water and wastewater system components and piping were installed in the 1940s; in the 1970s they were heavily modified to accommodate relocation of the facilities in the area. The aged water piping is heavily corroded and undersized.

The existing water system is not compliant with structural fire suppression requirements set by the National Fire Protection Association 1142: *Standard on Water Supplies for Suburban and Rural Fire Fighting* and National Fire Protection Authority 1194: *Standard for Recreational Vehicle Parks and Campgrounds*, both in terms of capacity and size of connected water service line. Currently, there are three existing potable water system connections intended for structural fire suppression, but with only 300 gallons of water storage the fire hydrants would only be able to provide what the well pump could produce, which is less than 10 percent of required flow for fire suppression.

The existing water system is not designed to meet Wyoming Department of Environmental Quality (WYDEQ) regulations. Many of the water lines in the campground are above ground, leaving them susceptible to damage by vehicles and freezing, as well as to surface water infiltration. Line ruptures have occurred at least once per year in the past few years. The existing pressurization equipment is also inadequate per WYDEQ regulations. The campground water lines often drop below the WYDEQ minimum static pressure requirements set to prevent infiltration and prevent contamination. Additionally, the system cannot meet the WYDEQ disinfection requirements for chlorine contact time.

The septic system in the South Jenny Lake visitor services area is also in need of replacement as it is not able to adequately treat the waste generated by visitors. Based on WYDEQ and Environmental Protection Agency (EPA) criteria for septic system sizing, the existing system is undersized by at least 43 percent of that required for the number of visitors in the area during the peak season. In addition to compromising treatment, the undersized septic tank must be pumped out an average of three times per summer. The pumped sewage and sludge is highly concentrated and often upsets sewage treatment processes in park lagoons where it must be dumped after being pumped.

In the Jenny Lake Campground there is one restroom located near the main entrance, which serves all 50 campsites. In addition to being a long distance from the farthest campsites located at the east end of the campground, the one existing restroom is not ABAAS compliant.

Within the Exum complex, there is a vault toilet that is located 10 feet to the west of the existing well-house and 56 feet from the existing well. The location of the vault toilet is non-compliant with WYDEQ requirements for isolation, which requires at least 100 feet separation between wells and vaults, and 25 feet separation from potable water pipes and vaults (WYDEQ Rules and Regulations, Chapter 25, Section 13, b).

String Lake Outlet Area

This extremely popular trailhead provides direct access to the recommended wilderness area along Jenny Lake and String Lake, Cascade and Paintbrush canyons, Hidden Falls, and Inspiration Point. The trails that approach the String Lake Outlet Bridge from both east and west have large areas of heavily compacted soils and bare ground. There are multiple user-created trails throughout the area. Periodically during the peak season, the parking lot fills leading to resource damage as visitors park on the roadside vegetation. Severe erosion has occurred on the east and west sides of the bridge.

Jenny Lake Overlook

Located on the one-way scenic loop, the Jenny Lake Overlook has been one of the most popular vistas in the park for almost a century. A paved trail (currently closed due to trail conditions) leads to the Jenny Lake shoreline from the parking area, but it exceeds 15 percent grade and is extremely hazardous due to eroded gravel and sand washing down from the hillside. Major structural retaining walls are failing, causing the hillside to be unstable. These walls support both the trail and parking lot above and are critical to the preservation of this overlook. Dry-laid stone retaining walls along trailheads and the Jenny Lake Overlook are in disrepair and the asphalt throughout is beginning to degrade. There are user-created trails, as well as erosion, compacted soil, and non-native vegetation throughout the area.

Backcountry

Wilderness

The backcountry and trails on the west side of Jenny Lake were recommended for wilderness designation in 1978; as a result, the NPS manages the area in the same manner as designated wilderness. In 1990 the Grand Teton National Park Backcountry Management Plan was developed to address management of this area (NPS 1990b). Annually thousands of people cross into the area unaware of its wilderness status and the specific management implications associated with it. There is no boundary identification and little education and/or interpretation regarding the wilderness. Park Management recognizes that this is a high-use wilderness area, but will encourage and facilitate existing recreational uses that are in keeping with the definitions and purposes of wilderness and that do not further degrade the wilderness resources and character, as for some people, it may be the only wilderness they experience.

West Boat Dock

Since the 1930s, there have been concession-operated boats transporting visitors to the west side of Jenny Lake for popular hikes into the backcountry. The current operation transports over 100,000 visitors a year, with close to 2,000 people a day during the peak season. The dock configuration is not conducive to long wait times, due to a lack of shade and shelter from inclement weather. In addition, the existing trail layout causes confusion and makes route-finding difficult for visitors stepping off the dock.

Hidden Falls/Inspiration Point

Hidden Falls and Inspiration Point are two of the most visited park destinations. The Hidden Falls Overlook is defined as the relatively level area at the base of the falls between Cascade Creek and the adjacent southern slope. The current trail into this overlook leads to a poorly defined and congested area. The area is so heavily used that surrounding soil and vegetation are impacted; very little topsoil remains and rocks and roots are exposed. In peak season, over a thousand visitors a day visit Inspiration Point, resulting in bare ground and compacted soils.

In both areas, heavy snow accumulations and associated run-off coupled with concentrated visitation has led to significant trenching, erosion, and exposure of sharp rocks and tree roots. Seasonally, both areas become muddy causing people to increase the extent of resource impacts by walking around the wet areas, creating widened tread and in some cases parallel trails. Exposed rock and roots at viewpoints and along trails have created tripping hazards and other unsafe walking conditions. Continued exposure of roots and trampling by high numbers of visitors will result in detrimental effects to vegetation and may result in increases in soil erosion.

Jenny Lake Trails and Bridges

Other than bridge replacement and routine trail work, very few trail improvements have been made to the Jenny Lake trails since they were first built in the 1930s (existing conditions are shown in Table 1). They were not designed for the large numbers of people who currently hike them every year and do not meet today's park trail standards. Several years ago, reconstruction began on portions of the trail immediately below Inspiration Point. The project was never properly completed, resulting in a matrix of large and jagged protrusions that need to be addressed. One of the most impacted areas in Cascade Canyon is located just west of Inspiration Point, where snowmelt and erosion have caused gullies in the trail up to 3 feet deep.

Due to the crowds, configuration of existing trails, creation of user-created trails, and inadequate route-finding, there is often confusion resulting in lost or separated parties. Previous efforts to direct visitors resulted in fencing and other unnatural barriers in the wilderness area, and a lack of clear route-finding.

Table 1. Examples of Trail Conditions in the Jenny Lake Project Area.

Goals of the Plan

The park set forth goals to guide management of the Jenny Lake area. Goals assist in determining if the proposed actions being considered are successful in meeting the purpose of the plan. The goals for the Jenny Lake Renewal Plan were developed with consideration of the park's purpose and significance, NPS policies and mission, and input from park staff, park partners, park stakeholders, and the general public. The alternative identified for analysis meets the following goals set forth for the plan:

Jenny Lake Renewal Project Goals *(Frontcountry)*

- Develop Jenny Lake interpretive programs that will provide visitors with varied experiences focusing on the major interpretive themes of the park, including education on the rich history of Jenny Lake, and the recommended wilderness it provides access to. Interpretation will promote public awareness of and appreciation for wilderness character, resources, and ethics.
- Enhance the experience of South Jenny Lake visitors by providing an entry point with an immediate sense of arrival and clear route-finding on ABAAS compliant trails that lead to access points for the scenic areas of Jenny Lake and the Teton Range.
- Restore and protect the natural and cultural resources of the Jenny Lake area by creating a more practical and intuitive trail system, rehabilitating user-created trails and other impacted areas, and protecting the integrity of historic properties.
- Improve visitor experience in the South Jenny Lake area by providing additional amenities, as well as replacing the outdated and undersized water and wastewater systems and restrooms to better accommodate the current number of visitors**.**

Jenny Lake Renewal Project Goals (*Backcountry*)

- Offer limited interpretation that introduces visitors to wilderness and all that it represents, creating connections for visitors that foster a sense of wilderness stewardship.
- Improve route-finding and trail/bridge conditions, creating an easily understandable trail system to better facilitate visitor safety, circulation, and access, while maintaining the area's wilderness and historic character.
- Restore and protect the natural, cultural, and wilderness resources of the Jenny Lake area by improving trail conditions, key visitor locations, and traffic patterns, as well as revegetating undesirable user-created trails and other impacted areas.

Areas and Issues Not Addressed in this Plan

This plan does not cover work taking place in the String Lake picnic area and associated parking lot or the one-way scenic loop, except for Jenny Lake Overlook. The plan only addresses the existing number of visitors. Proposed changes in acceptable visitation levels will be supported with future visitor use and resource studies. This plan does not address issues related to any commercial services at Jenny Lake.

Relationship to Other Plans and Policies

Current plans and policies that pertain to this proposal include the Grand Teton National Park Master Plan (NPS 1976); Jenny Lake Development Concept Plan (1977); revised wilderness recommendation memoranda for Grand Teton National Park (1978); Backcountry Management Plan (NPS 1990b); Teton Corridor Moose to North Jenny Lake Development Concept Plan/EA (NPS 1990a); Foundation for Planning and Management for Grand Teton National Park and John D. Rockefeller, Jr. Memorial Parkway (NPS 2006a); Grand Teton National Park Transportation Plan (NPS 2006b); and *NPS Management Policies 2006* (NPS 2006c). Information about these plans and policies is described below:

Master Plan, Grand Teton National Park (1976): The Grand Teton National Park Master Plan (NPS 1976) is the overall guiding document for park planning. This conceptual document established guidelines for management and use of Grand Teton National Park. The Jenny Lake Renewal Plan implements many provisions found in the master plan, including management of Class II areas – General Outdoor Recreation (access roads, parking, visitor plaza, and campground); Class III areas – Natural Environment (areas between Class II and recommended wilderness); Class IV areas: Outstanding Natural (sections of the Teton Range and the Potholes); and Class V – Primitive (recommended wilderness). This plan also includes increasing the level of interpretation in the Jenny Lake area. Subsequent amendments to the Master Plan affecting the Jenny Lake area were listed in the Teton Corridor Moose to North Jenny Lake Development Concept Plan/Environmental Assessment (NPS 1990a).

Jenny Lake Development Concept Plan (1977): The 1977 Development Concept Plan defined major issues in the Jenny Lake area and identified measures to alleviate them to ensure that uses did not degrade the natural environment. The plan moved development away from prime resource areas and enhanced visitor experience by expanding interpretive services, upgrading concessioner facilities, and de-emphasizing facilities and uses that adversely affect the environment.

Wilderness Recommendation (1978): In 1972, Grand Teton National Park completed a wilderness study in accordance with the Wilderness Act that subsequently was transmitted to Congress (NPS 1972). In 1978, the NPS recommended that Congress include approximately 143,454 acres of the park's backcountry in the National Wilderness Preservation System. Approximately 122,604 acres of the park have been identified as recommended wilderness and another 20,850 acres have been identified as potential wilderness (NPS 1978). The project area contains lands identified as recommended wilderness. During this time there was discussion about whether the wilderness qualifications of the heavily visited Hidden Falls/Inspiration Point area were appropriate. After careful deliberation, the area was included in the 1972 and subsequent 1978 wilderness proposals with the understanding "that this area can be properly managed as wilderness." To date, Congress has not enacted legislation to include the recommended wilderness in the National Wilderness Preservation System. However, NPS policy requires that the recommended, potential, and suitable wilderness land in the park be managed as wilderness (so as not to preclude eventual designation) until such time as Congress either officially designates the land as wilderness or rejects the designation.

Backcountry Management Plan, Grand Teton National Park (1990): There are more than 122,000 acres of recommended wilderness in Grand Teton National Park, including the Hidden Falls/Inspiration Point area. The 1972 Grand Teton Wilderness Recommendation and Grand

Teton National Park's 1990 Backcountry Management Plan acknowledged that both heavily visited and pristine wilderness areas exist in the park.

Teton Corridor Moose to North Jenny Lake Development Concept Plan/Environmental Assessment (1990): The Development Concept Plan detailed specific actions for implementing broad management strategies for the Teton Corridor, including the Jenny Lake area. The plan called for upgraded visitor facilities, expanded facilities for interpretation and improvements in interpretive services, relocation of some facilities (including historic structures), and consolidation or streamlining of concessioner operations.

Foundation for Planning and Management, Grand Teton National Park and John D. Rockefeller, Jr. Memorial Parkway (2006): The proposed actions considered in this EA are consistent with the 2006 Foundation for Planning and Management. The document states that visitors of all ages and physical abilities have opportunities to understand, appreciate, and enjoy the wonders of the park in many different ways and seasons in a manner that does not diminish the fundamental resources and values of the park. Visitors forge their own emotional and intellectual connections with the meaning and significance inherent in the park and its resources and its vital role in the National Park System. It further states that the park also provides visitors an opportunity to understand, enjoy and be inspired by the wonders of the park in many different ways in a manner that does not diminish its fundamental resources and values: Scenery, Geologic Processes, Ecological Communities and Wildlife, Aquatic Resources, Cultural History and Resources, Natural Soundscapes and Acoustic Resources, and Visitor Experiences in an Outstanding Natural Environment, all of which can be enjoyed within the Jenny Lake area.

Transportation Plan, Grand Teton National Park (2006): This plan addresses transportation-related issues in the park. The plan recommends a preferred system of transportation improvements, including roadways and parking, development of a plan to evaluate the need and feasibility for a transit system within the park, construction of improved road shoulders and multiuse pathways, transportation-related improvements to developed areas, and development of traveler information systems. The plan identifies the park's overall strategy for managing existing parking areas with no net gain of impervious surfaces and making the best, most efficient use of existing paved areas through modifications. This plan includes minor parking area modifications, such as simple parking lot redesign, reconfiguration of traffic flow, signage, re-striping, allocating sections to compact vehicle parking, redistributing the proportion or number of spaces to RVs, and other engineering techniques that could easily improve the efficiency of parking areas and somewhat increase their capacity without increasing the impervious surface in that area. The Grand Teton National Park Transportation Plan Environmental Impact Statement (EIS) analyzed the installation and implementation of the multi-use pathway system that currently terminates at South Jenny Lake. The Record of Decision for the Transportation Plan was signed in 2007.

NPS Management Policies (2006): The NPS has established policies for all National Park System units under its stewardship in this guidance manual. The proposed actions considered in this EA are consistent with the guidance and policies of the *NPS Management Policies 2006*.

Impact Topics Retained For Further Analysis

Impact topics for this project were identified on the basis of federal laws, regulations, and orders; *NPS Management Policies 2006*; and NPS knowledge of resources at the park. Impact topics that are carried forward for further analysis in this EA include:

- **Cultural Resources including Cultural Landscapes, Historic Structures, Ethnographic Resources, and Archeological Resources**
- **Geologic Resources and Vegetation**
- **Wildlife, including Special Status Species**
- **Wilderness**
- **Natural Soundscapes**
- **Visitor Experience**
- **Park Operations**

Impact Topics Dismissed From Further Analysis

The NPS takes a "hard look" at all potential impacts by considering the direct, indirect, and cumulative effects of a proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates major effects as significant effects. The identification of major effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines "measurable" impacts as moderate or greater effects. It equates "no measurable effects" as minor or less effects. The use of "no measurable effects" in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses "no measurable effects" to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail, in accordance with CEQ regulations at 1500.1(b).

In this section of the EA, the NPS provides a limited evaluation and explanation as to why several impact topics are not evaluated in more detail. Impact topics were dismissed from further evaluation either because the resource does not occur in the area or because through the application of mitigation measures, there would be minor or less effects (i.e., no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic. An effect would be negligible if the resource would not be affected or if the effect would be so small that it would not be detectable or measurable. A minor effect would be detectable or measurable, but would be of little importance.

Because there would be negligible or minor effects on the dismissed impact topics, the contribution from an alternative to cumulative effects for dismissed topics would be low or none. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of effects is presented.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality-related values associated with special protected areas, including national park lands. Section 169A of the Clean Air Act sets forth a national goal for visibility which is the ''prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.'' Further, the act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

Construction activities would result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized. With mitigation and local breezes off the lake, which would likely rapidly disperse pollutants, impacts on air quality would be minor. The Class I air quality designation for the park would not be affected by the proposed actions. Because the effects on air quality would be minor or less, this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

Climatologists are unsure about the long-term effects of global climate change; however it appears that the planet is experiencing a warming trend that affects ocean currents, sea levels, polar sea ice, and global weather patterns. It is anticipated that these changes will affect winter precipitation patterns and amounts in the park. Specific changes in Grand Teton National Park could include reduced snowpack, earlier snow melt, loss of glaciers, decreased snow-related winter recreation, greater aridity, fewer opportunities for boating and rafting, increased mortality among all tree species but particularly the loss of aspen groves, loss of habitat for mountain sheep, increased fish kills, and reduced trout habitat (Saunders et al. 2009). Some of these changes may occur, but the full extent of climate change impacts to resources and visitor experience is not known, nor do managers and policy makers yet agree on the most effective response mechanisms for minimizing impacts and adapting to change. It is not possible to link the greenhouse gas emissions from individual projects to effects on regional or global climatic patterns. While construction activities associated with the renewal plan would emit greenhouse gases, emissions would be negligible and would not be discernible at a regional scale. The park would adapt facilities operationally in the future, as needed, but such actions are not within the scope of this project. Therefore, this topic is dismissed from further analysis in this document.

Environmental Justice

Executive Order (EO) 12898, General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. None of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations or communities, as defined in the EPA's Final Guidance for Incorporating Environmental Justice

Concerns (EPA 1998). Because there would be no disproportionate effects, this topic is dismissed from further analysis in this document.

Floodplains

The NPS manages floodplains in accordance with EO 11988, Floodplain Management, and NPS DO 77-2, Floodplain Management. EO 11988 requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. DO 77-2 states that certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains. In accordance with these orders as well as the *NPS Management Policies 2006*, the NPS strives to preserve floodplain values and minimize hazardous floodplain conditions. Natural floodplain values and functions must be protected and risks to life and property must be minimized by avoiding the use of the regulatory floodplain wherever there is a feasible alternative location. The Jenny Lake Renewal Plan complies with these directives, as proposed activities/improvements that cross or are adjacent to Cottonwood Creek and Cascade Creek floodplains would not affect the function or value of the floodplains and are in day-use areas; therefore, they are exempt from the requirement to prepare a statement of findings. The Snake River is approximately 3 miles away from the project area. Because there are no floodplains affected in the project area, this topic is dismissed from further analysis in this document.

Indian Trust Resources

Secretarial Order 3175, Departmental Responsibilities for Indian Trust Resources, requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The park's lands and resources related to this project are not held in trust by the Secretary of the Interior for the benefit of Native Americans. Because there are no American Indian trust resources in the park, this topic is dismissed from further analysis in this document.

Lightscape Management

In accordance with *NPS Management Policies 2006*, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light (NPS 2006c). The park strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. Furthermore, the park strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. There is minimal existing lighting in the South Jenny Lake developed area. The proposed action does not include the addition of any exterior lighting. Since construction would occur during the day, it would not affect the visibility of night skies. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this document.

Museum Collections

According to DO 24, Museum Collections, the NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, the NPS museum collections. The only museum collections located in the project area, are in the Crandall Studio during the summer.

Because none of the alternatives would change the location or conservancy of these resources, alter conservancy demands or requirements, or alter the risk of damage (such as by flooding), there would be no effects to museum collections. This topic was dismissed from further analysis in this document.

Paleontological Resources

According to *NPS Management Policies 2006*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006c). There are no known paleontological resources within the project area. Because there are no known paleontological resources in the project area, this topic is dismissed from further analysis in this document. In the event that paleontological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until an appropriate mitigation strategy could be developed.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service, and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. The project area does not contain prime or unique farmlands (Young 1982). Because there would be no effects on prime and unique farmlands, this topic is dismissed from further analysis in this document.

Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economy of Teton County, Wyoming due to minimal increases in employment opportunities for the construction workforce and revenues for local businesses and governments generated from these additional construction activities and workers. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Because the project would have a negligible effect on social and economic conditions, this topic is dismissed from further analysis in this document.

Water Resources

The Clean Water Act of 1972 (33 U.S.C. 1251 et seq.) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and for regulating water quality standards for surface waters. The purpose of the act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The *NPS Management Policies 2006* require protection of water quality consistent with the act and state that the NPS will perpetuate surface water and groundwater as integral components of park aquatic and terrestrial ecosystems.

Surface waters in the project area include Jenny Lake, String Lake Outlet, and Cottonwood Creek in the frontcountry, and Cascade Creek in the backcountry. Water quality and quantity are not expected to be affected by the project in either area.

Water quality testing took place in the backcountry waters of Grand Teton National Park from 1997 through 2000. Human coliforms were present in Cascade Canyon consistently throughout the study (Tippets 2001). There has been no formal testing since 2000. In the summer of 2012, park staff performed an informal survey to find evidence of a problem related to the lack of restrooms on the west side of the lake. The results from that survey suggest there is not a problem that could be solved with a facility on the west side.

In the frontcountry, there would be some changes to the amount of impervious surface; however, the difference is expected to be negligible. Existing user-created trails would be rehabilitated and trails would be repaired to reduce the potential for erosion. Disturbed areas would be revegetated and recontoured following construction to reduce the potential for water quality effects related to surface runoff and erosion.

Groundwater is not likely to be affected by the project, as the relatively small amount of groundwater that is pumped would not cause a substantial decline of the water table, and the water table would recover during the seven months of the off-season when no groundwater pumping occurs (Martin 2013).

Construction would require a Large Construction General Permit for their stormwater discharges, and a Stormwater Pollution Prevention Plan would be prepared. As a result, the proposed action would result in only negligible to minor effects to water resources. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this document.

Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water 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. Wetlands generally include swamps, marshes, bogs and similar areas."

EO 11990, Protection of Wetlands, requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge of dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in *NPS Management Policies 2006* and DO 77-1, Wetlands Protection, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1, Wetlands Protection, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

In October 2013, a wetland survey was conducted in areas where disturbance near wetland habitats would occur to determine the presence or absence of wetlands. No wetlands were located within the potential areas of disturbance (North Wind 2013). Because impacts to wetlands would be avoided, this topic is dismissed from further analysis in this document.

Wild and Scenic Rivers

On March 30, 2009, President Obama signed the Omnibus Public Land Management Act of 2009, as Public Law 111-11. Title V, Subtitle A, Section 5002 of the act amends the Wild and Scenic Rivers Act to add approximately 388 miles of rivers and streams of the Snake River Headwaters to the National Wild and Scenic Rivers System. The NPS administers 121 miles of designated river segments; the remaining portions are within the adjacent Bridger-Teton National

Forest. This project would not affect the Snake River's outstandingly remarkable values, free flow condition, or water quality; therefore, this impact topic was dismissed from further analysis in this document.

ALTERNATIVES

This chapter of the Jenny Lake Renewal Plan presents two alternatives for future management of the Jenny Lake area, including the NPS preferred alternative. The alternatives were developed to fit the purpose and need for the project as discussed in Chapter 1. Alternative A, the No Action alternative, presents a continuation of current management direction and provides a baseline for comparing the consequences of implementing the action alternative—Alternative B. Alternative B addresses issues related to providing a safe, environmentally sensitive, and enhanced visitor experience at Jenny Lake. The description of the alternative includes an overall concept, and specific proposed actions related to visitor services, route-finding, interpretation, resource protection, and health and safety. The action alternative includes mitigation to reduce project effects on natural, cultural, and social resources. Mitigation measures that would be used to reduce or avoid impacts are listed after the descriptions of the alternatives (see *Mitigation Measures* section later in this chapter). This chapter also includes a section on the environmentally preferable alternative and actions dismissed from detailed analysis. Two summary tables are presented at the end of the chapter: a comparison of the alternatives related to the project goals and a comparison of the predicted impacts of the alternatives.

Alternative Development

The Jenny Lake backcountry is the most popular destination in the park's recommended wilderness. Easily accessed by foot, by horseback, and by boat, it attracts over 500 people per hour on the trail below Hidden Falls during the peak summer season. Because of the large numbers of visitors in this area, the Hidden Falls area was classified by the *2006 Outdoor Recreation in the Greater Yellowstone Area Interagency Report* as vulnerable to unintended setting changes given current conditions and trends of increasing use (Greater Yellowstone Coordinating Committee 2006). This report brought widespread attention to the condition of the Jenny Lake backcountry. In response to the findings of the 2006 Technical Report, the park started assessing conditions in the Jenny Lake area. A summary of this process, which began in 2008 and continued through final alternative development in 2013, is presented in the following paragraphs.

2008 Grand Teton National Park Trail Crew Recommendations

In 2008, the park's trail crew started a formal assessment of trail conditions in the Jenny Lake backcountry, including Hidden Falls and Inspiration Point. Throughout the area, poor drainage led to constantly damp soils from snow melt and rain events. Runoff exposed rock and root structures and created large gullies within the trails leading to the loss of soil and vegetation. Deferred maintenance, short work seasons, and high visitor traffic have led to conditions where routine maintenance and minimal improvements are no longer effective at providing trail stabilization. Stabilizing structures such as waterbars and erosion checks were sporadic and/or ineffective due to a lack of maintenance and/or replacement. In addition, many of the improvements in this area were built with timber structures that have a shorter lifespan than stone structures and need to be replaced frequently rather than just being maintained.

Due to the extent of repairs necessary and the heavy visitor use in the area, the crew looked at a number of methods for developing a durable and sustainable trail system that would last long into the future, with limited routine maintenance. They determined that the following would need to be undertaken to address the existing conditions: new and replacement retaining structures and drainage features would be required to hold fill and prevent erosion; retaining walls and bridges

would need to be replaced where necessary; and user-created trails should be closed and rehabilitated. Planning at this point determined that local stone would be the best material for structures and fill, as it would withstand the rigors of extreme cold/snow and tremendous foot traffic, lasting much longer than wood in this local climate, and would be aesthetically acceptable.

Preliminary designs included rehabilitating over 8,000 linear feet (LF) of trail tread; replacing four bridges; building multiple stone retaining walls; creating a sustainable, approximately 640 square foot, low-impact viewing area for Hidden Falls; and completing several thousand square feet of restoration. This preliminary design required over 4,000 tons of rock and gravel.

2011 Architectural and Engineering, Predesign Document

In 2011, an architectural and engineering firm developed preliminary designs for frontcountry and backcountry activities, which incorporated the 2008 recommendations as well as new information gathered from park staff and site visits to both areas. The frontcountry designs were satisfactory, but park staff determined that the backcountry designs did not do enough to preserve wilderness resources and values. In the spring of 2012, Grand Teton Facility Management Division developed alternative designs for the backcountry work based on goals outlined by park personnel that were in alignment with the 2004 Grand Teton National Park Trail Standards in addition to being balanced with wilderness values.

2012 Project Planning

Throughout 2012, an interdisciplinary team of park employees met frequently for the purpose of developing the project purpose, need, and goals. Public scoping comments, NPS and other federal government mandates and policies, and previous planning efforts were also considered by the planning team.

In October 2012, focus groups were gathered to brainstorm current challenges relating to resources and operations within the Jenny Lake Project area. Interview sessions included individuals with expertise in resource areas, including individuals not on the official interdisciplinary team. Sessions consisted of the following topics/staff: 1) interpretation, science and resource management, and the park's Wilderness Committee; 2) trails and facilities; 3) park management, including the superintendent and deputy superintendent; 4) Grand Teton National Park Foundation Trail's Committee; and 5) law enforcement and business resources. Over 30 people attended throughout the five sessions, contributing valuable information regarding issues and potential opportunities that was then incorporated into a subsequent value analysis (VA) workshop (described below), the Jenny Lake Interpretative Master Plan, and this plan/EA.

2013 Value Analysis

A VA workshop was held at Grand Teton National Park on February 11-14, 2013, to finalize the alternative development process. The VA team was composed of a mix of professional disciplines including design, operations, and engineering, as well as natural and cultural resources. Park staff supported the team with knowledge of the site and its operation. At the workshop, the team reviewed the original preliminary alternatives for the project and proposed additional alternatives. The team then reviewed the merits of all alternatives to determine which represented the most viable options. These alternatives were evaluated in the VA workshop using a process called Choosing by Advantages (CBA), where decisions are based on the importance of advantages between alternatives.

The advantages of each alternative and its long-term life-cycle costs were considered in developing the preferred alternative. The latter included costs for building, maintaining, staffing, and operating the new and upgraded facilities. The planning team strove to develop a preferred alternative that provides the American public and the NPS with the greatest overall benefits for the criteria listed below at the most reasonable long-term cost.

For the backcountry, the VA analyzed 21 different actions based on work locations for potential work and when necessary, different options for each area. For the frontcountry, 12 actions were analyzed. Actions at the 33 locations were ranked on the following criteria and sub-factors:

1. Protect Public and Employee Health, Safety, Welfare
    a. Sub-Factor: Reduce Risk / Probability of Accidents
2. Prevent Loss of Resources, Maintain / Improve Condition of Resources
    a. Sub-Factor: Minimize Impacts to Vegetation & Soil
    b. Sub-Factor: Minimize Wildlife Impacts
    c. Sub-Factor: Protect / Improve Wilderness Character
3. Improving Visitor Services, Educational & Recreational Opportunities
    a. Sub-Factor: Improve Visitor Experience of Trail System
    b. Sub-Factor: Create Opportunity for Visitors to Connect to Jenny Lake Area
4. Improve Operational Efficiency, Reliability & Sustainability
    a. Sub-Factor: Improve Operational Efficiency
5. Provide Cost Effective, Environmentally Responsible & Beneficial Development to NPS
    a. Sub-Factor: Create Fundable Improvements

The final alternative analyzed in this document, was produced during the VA as a result of the prioritized ranking. Quantities of materials to be utilized in the backcountry were reduced by close to 40 percent, reducing the potential flight time correspondingly from original designs, as it was determined further reduction would compromise the sustainability and durability of the trails and bridges. This alternative has the least amount of impact on the resource compared to all other alternatives previously produced and provides the largest improvement/stabilization to the resources. After further development, the design was reviewed by landscape architecture staff at Glacier National Park and a private landscape architecture firm in Jackson, Wyoming. This alternative also underwent a quality assurance review by interdisciplinary staff at the NPS, Denver Service Center.

An additional VA/CBA was conducted on October 23, 2013, to consider alternatives for the water and wastewater systems at South Jenny Lake. Those preliminary findings were used in development of the utility design alternatives in this plan.

One action alternative and the No Action alternative are carried forward for further evaluation in this EA. Descriptions of these alternatives are presented below. Alternatives considered but dismissed are described later in the chapter.

Funding and Implementation

Approval of this plan does not guarantee that the federal or private funding needed to implement the plan would be forthcoming. The alternatives were developed with the expectation that federal budgets would be constrained for the foreseeable future. Individual elements of the plan may be implemented over time as funding becomes available.

Elements Common to All Alternatives

Alternative B would substantially improve the trails and facilities in the Jenny Lake area. However, some management actions are planned that would occur under both the No Action alternative and Alternative B. Actions common to both alternatives include the following.

- **Trail Maintenance.** Some sections of routine trail maintenance and improvements would occur under both alternatives following the Trail Standards and Guidelines for Grand Teton National Park Programmatic Categorical Exclusion (PCE). This PCE covers general trail maintenance routinely performed by the Grand Teton National Park trail crew that is planned for the southwest portion of the Jenny Lake Trail, the Horse Trail, and other trail segments. Trail maintenance covered under the PCE includes construction of water bars, erosion checks, causeways, culverts, and other maintenance such as drain cleaning and trail outsloping. The proposed work on the southwest portion of the Jenny Lake Trail would occur along a 2-mile segment of trail. Work authorized under this PCE was initiated along this segment by NPS staff in 2013 and will continue into 2014, along with work on the Horse Trail and the Lower Cascade Canyon Trail. The latter connects Inspiration Point to the mouth of Cascade Canyon where the Horse Trail meets the main trail.
- **ABAAS Compliance.** The existing restroom in the South Jenny Lake developed area would be upgraded to be ABAAS compliant under both alternatives. Modifications may require widening stalls and removing several fixtures. Other improvements may also occur to enhance universal access within the developed area.
- **Public Boat Launch.** A large rock submerged about 20 feet from the public boat launch that interferes with commercial and private boat access would be reduced.
- **Interpretation.** An Interpretive Master Plan has been developed for the Jenny Lake area that includes interpretation and education regarding the Jenny Lake area and the park's recommended wilderness (NPS 2013a). This plan, developed in 2013 with input from park staff, project partners, and design consultants, documents the opportunities to improve the overall visitor experience at Jenny Lake. The plan builds on the interpretive framework established at the Craig Thomas Discovery & Visitor Center by focusing on three overarching topics: people, place, and preservation. Enhanced route-finding, orientation, trip planning tools, and tactile interactive elements are included in the plan to encourage visitors to explore the Jenny Lake area and learn about the unique history, geology, and stewardship that has led to its preservation. The plan provides guidance for park staff to assist them in developing programs for visitors to make intellectual and emotional connections to the cultural and natural resources of the Jenny Lake area, including the adjacent wilderness.
- **Parking Enhancements.** The park's overall strategy for managing existing parking areas is to strive for no net gain on impervious surfaces and to make the best, most efficient use of existing paved areas through modifications. Minor modifications would be considered to make parking more efficient such as restriping, delineating over-sized vehicle parking, and designating roadside parking. At the same time, the park would continue to explore systems of visitor education and messaging about timing and availability of parking at Jenny Lake.
- **Use of the Minimum Requirements and Minimum Tools for Management Actions in Recommended Wilderness.** Per *NPS Management Policies 2006* (NPS 2006c), the park's manager must apply the "minimum requirement" concept to all management activities that

affect the wilderness resource and character of the park. Minimum requirement is a documented process the NPS uses to determine the appropriateness of all actions affecting wilderness. This concept is intended to minimize impacts on wilderness values and resources. DO 41, Wilderness Stewardship, sets forth guidance for applying the minimum requirement concept to protect wilderness and for the overall management, interpretation, and uses of wilderness (NPS 2013b). In accordance with NPS policy, a minimum requirements analysis was completed to analyze the impacts of the proposed action in the recommended wilderness portion of the project area (NPS 2006c, section 6.3.5; see Appendix A).

Alternatives Carried Forward

Alternative A – No Action

Alternative A provides a baseline for evaluating the changes and impacts presented in the action alternative. Under the No Action alternative, the NPS would continue to manage NPS visitor services at Jenny Lake as it currently does (Figures 3 and 4). NPS managers would continue to take necessary actions to resolve unanticipated problems that arise and would continue to strive to protect and preserve natural, cultural, and wilderness resources in the Jenny Lake area, while also providing for a safe, quality visitor experience.

Under Alternative A, routine maintenance of the trails and facilities would continue as funds are available, but overall upgrades and redesign to the trails and facilities in the Jenny Lake area would not occur. There would be few changes in visitor facilities or access. The Jenny Lake Interpretive Master Plan would be used for staff guidance on interpretation of the Jenny Lake area, rather than for design of new exhibits, signs, etc. Under the No Action, continued routine maintenance of the water and wastewater systems would occur, with repairs as needed, but neither system would be replaced. The water and wastewater systems would continue to be undersized to meet future demands for potable water, water for fighting structural fires, and sewage treatment. Should Alternative A be selected, the NPS would respond to future needs and conditions without major actions or changes to the present course of action.

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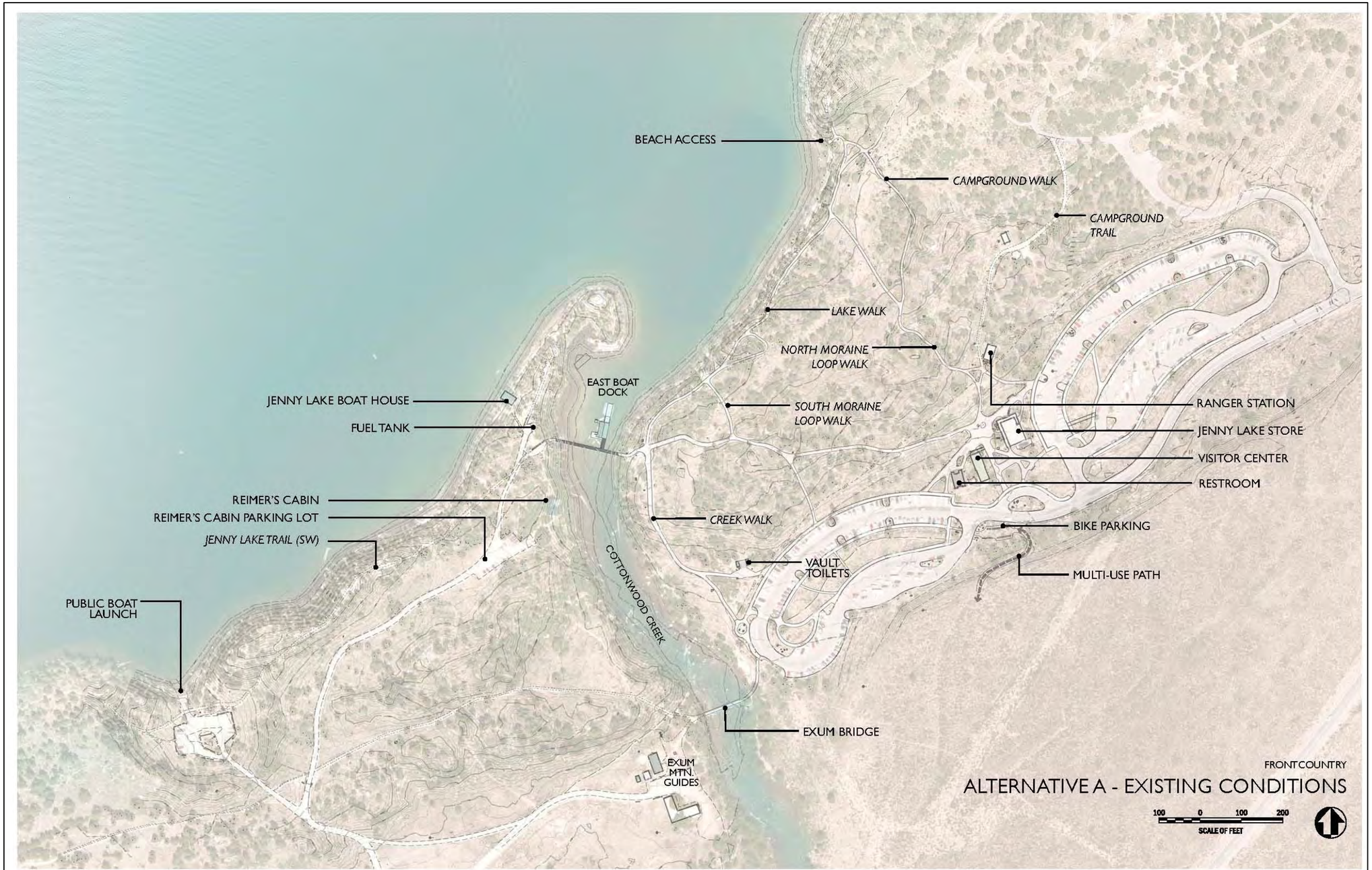


Figure 3. Alternative A, No Action, Frontcountry

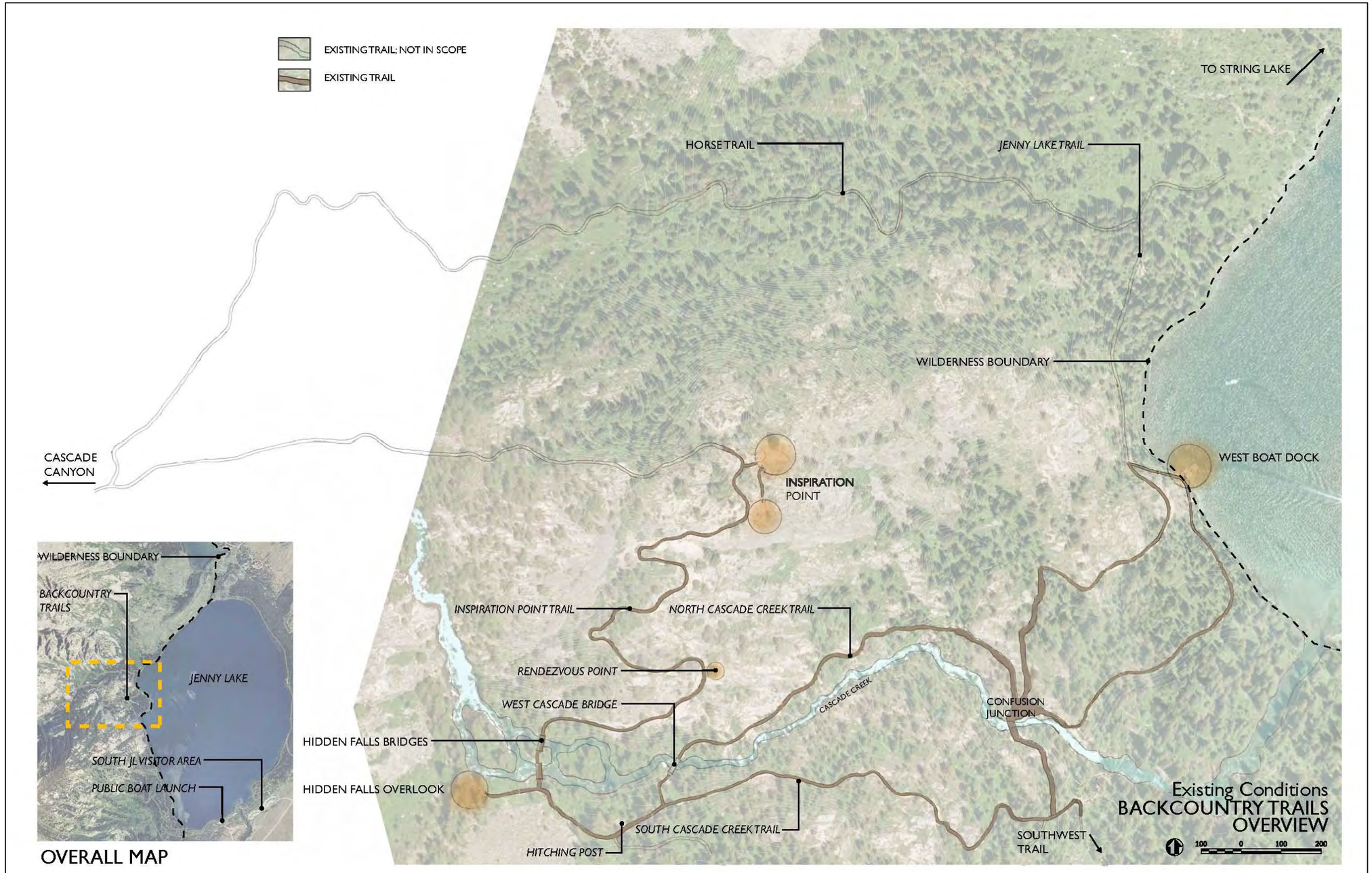


Figure 4. Alternative A, No Action, Backcountry

Alternative B – Upgrade Jenny Lake Trails and Facilities

Alternative B represents the NPS plan for improving existing conditions at Jenny Lake. The purpose of the Jenny Lake Renewal Project is to provide a safe, environmentally sensitive, and enhanced visitor experience at Jenny Lake. Renovation of the frontcountry and backcountry areas of Jenny Lake would be sustainable and durable. Features and activities would be implemented that are of a quality, scale, and character that complements this historic area, protects park resources, and elevates visitor experiences. This project would be constructed by park trail crews as well as contractors over multiple construction seasons.

The following text describes the components of Alternative B. Descriptions are broken out by the work proposed in the frontcountry and backcountry areas. Illustrations of the area and proposed renovation designs immediately follow the descriptions. See Figures 5-10 for the frontcountry and Figures 11-14 for the backcountry.

The description of this alternative is based on preliminary designs and the best information available at the time. Details used to describe the alternative are estimates and could change during final site design. If modifications during final design are consistent with the general intent and effects of the described alternative, additional compliance would not be required.

Frontcountry

The frontcountry effort encompasses the South Jenny Lake developed area and extends along the shoreline west to the public boat launch (Figure 5). To the east, the project area extends to the Jenny Lake Campground. The frontcountry also includes the Jenny Lake Overlook along the one-way scenic loop and the String Lake Outlet trailhead area. The frontcountry effort was designed in large part to address the need for improved visitor orientation and interpretation and to improve visitor circulation throughout the South Jenny Lake developed area. Equipment that would likely be used for project activities in the frontcountry includes but is not limited to the following: crane, front end loader, jackhammer, pneumatic hammer, dump truck, paving machine, trencher, scraper, backhoe, bobcat, and forklift. Proposed features are presented below in the order of how they are most likely to be encountered from the Jenny Lake turnoff from the Teton Park Road.

- **Bike Parking for Multi-use Pathway (Figures 5 and 6).** The bike parking area and parking racks located on the south side of the entrance road on the way into South Jenny Lake would be reconfigured to accommodate additional bike parking. A new pedestrian crossing would be added west of the visitor drop-off and bike parking areas to enhance visitor safety.
- **Visitor Drop-Off (Figure 6).** The drop-off area would be redesigned for entering vehicles to have direct sightlines to identifying signs and elements in the visitor center interpretive plaza. The vehicular drop-off would be clearly delineated and expanded to provide safe staging for large and small vehicles, as well as for the potential future increase of transit efforts. Clarified auto circulation in this area would make it safer for pedestrian crossing from the bike parking area.
- **Visitor Center Interpretive Plaza (Figure 6).** This area represents the primary Jenny Lake frontcountry and backcountry access point. Proposed work in the Visitor Center Interpretive Plaza would improve the visitor's sense of arrival by creating one primary gateway to the newly renovated visitor center plaza. The overall concept for this area is to clearly welcome visitors to the Jenny Lake Visitor Center with a notable "front door." The entry is focused in

the large plaza between the visitor center and the Jenny Lake Store, immediately adjacent to the expanded drop-off area. The drop-off, visitor plaza, and landscape features would all serve to establish a sense of arrival at Jenny Lake. Interpretive and directional information would be concentrated in this central area, and appropriately scaled to compliment and not overwhelm the plaza. The park's small historic entrance station building, currently located at the Moose Entrance, would be relocated in direct sight of the drop-off and pedestrian entries. The building would be unstaffed and remain open at all times with welcoming, interpretive, and route-finding information. The flag pole would be relocated at the entry near the historic entry station building. Benches for resting and waiting would be located around the plaza and shade trees would be planted in suitable locations. A separate picnic area with tables would be located north of the Jenny Lake Store. Water fountain/water filling stations would be located near the Jenny Lake Store and the restrooms. The new interpretive components in the plaza would welcome, orient, and provide route-finding, as well as information about Grand Teton National Park and the Jenny Lake area, carrying out the vision of the interpretive master plan. Tactile and interactive elements would provide opportunities for visitors of all abilities and ages to interact with the compelling stories of the Jenny Lake area and the park.

- **Additional Restrooms (Figure 6).** A new ABAAS compliant restroom would be constructed adjacent to the existing restroom, doubling the number of restroom facilities in this area. The new building would be of a comparable scale to the existing one. Design would be complimentary to the full-round logs of the existing structures. The existing restroom would be left as is, with some slight modifications to make it ABAAS compliant. The proposed restrooms would be located immediately adjacent to the interpretive plaza, but away from the primary circulation paths. A small shelter is proposed next to the restrooms with benches and a water fountain/water filling station.

  New utility service lines would be installed to connect the new building with the area's water transmission and wastewater conveyance lines. The locations for these new service lines would be determined based on the final design of the replacement systems (described below).

  Two vault toilets would be constructed directly east of the visitor center, next to the parking lot. These vault toilets would be available for both peak and off-season users but would be located away from the visitor plaza to control undesirable odors.

- **Monitoring Need for Additional Restrooms.** Monitoring would be undertaken to determine the need for additional restrooms for individuals heading to the trail system on the west side of Jenny Lake. Throughout the planning process, there has been thoughtful consideration regarding the large number of visitors to the west side of Jenny Lake and the resulting possible need for toilet facilities to accommodate them. In an attempt to gather preliminary data and better understand the potential problem, NPS staff conducted an extensive survey between June and September of 2012 to establish baseline information about the extent of human waste in the Hidden Falls/Inspiration Point area and found the problem was not persistent enough to warrant restrooms on the west side. The park did decide to begin an education program regarding the absence of bathroom facilities in the backcountry areas and the proper disposal of human waste in those areas so potential visitors are better informed and can plan ahead. Further study of the potential human waste problem in the backcountry of Jenny Lake would be followed by subsequent studies to determine the need for vault toilet facilities near the east boat dock. If future data from continued monitoring suggests that there are threats to the resource, the park will further consider the installation of vault toilets near

the concessioner boat dock on the east side of the lake. If determined to be beneficial, ABAAS vault toilets (two unisex) would be located adjacent to the plaza in the location of the existing trail and walls **(**Figure 8**)**. These would constitute a "last chance" for visitors before getting on the boat or starting their hike around the lake. The plaza would be designed to allow vehicle access to service the restrooms.

- **Trail (Walkways) Circulation (Figures 6 and 7)**. The proposed trail system is intended to clearly circulate and orient visitors to Jenny Lake with a series of unique overlooks and access points at the lake edge. The primary and secondary walkways from the visitor center would terminate on the lake edge with overlooks located in areas of existing disturbance and erosion. All walkways would be hardened and widened as necessary to accommodate users and alleviate congestion. The ABAAS compliant primary walkway to the lake would be located directly off the interpretive plaza to the north. The widened entry and route-finding signs would intuitively lead visitors to the shortest and most direct route to the lake. A portion of this walkway would be re-aligned to terminate directly at an existing lake edge viewing area. The former trail would be revegetated. Visitors would have the option to access the lake and boat dock from a secondary walkway off the west end of the plaza. This walkway would be routed directly to the lake and overlook on an existing path. The existing, direct route to the boat dock, with steep grades and degraded cobble walls, would be removed and reclaimed. Deteriorating asphalt would be repaired or replaced. Several confusing and/or redundant trails would be redesigned or eliminated. User-created trails that have developed over the years and that contribute to the confusing pedestrian experience throughout the area would be eliminated. When possible, unnecessary fencing and other manufactured features would be relocated or eliminated to improve scenic quality.

- **Lake Overlooks and Access (Figure 7).** A number of overlooks would be established at the lake edge. Materials for the overlooks would be regional stone and exposed aggregate concrete with historic CCC or traditional NPS-style construction for durability and appropriateness. Minor clearing of small shrubs and trees may be required to open views to the lake from these overlooks. The Lake Overlook would be the primary scenic vista at the lake edge along the Moraine Loop Walk. The Inlet Overlook, located southwest of Lake Overlook, would provide another opportunity for viewing the lake. Both overlooks would present orientation and interpretation information to visitors. Benches would be provided, as well as walls dimensioned for seating.

  The proposed Aspen Knoll Overlook (Figure 5) would be located on a steep knoll on the northern end of the Lake Walk. Currently, there are wooden steps in this location that would be replaced with stone steps. Improvements would be made at the top of the overlook in areas of existing disturbance. This overlook would include a wooden bench in a small aspen grove with a unique view to the northern lake shore. A small stone edger wall would be installed to indicate that there is no lake access at this location. The wall would be constructed to allow for seating. Interpretive signs are also proposed to be added in this area. Similarly the Lodgepole Knoll Overlook would include a bench for resting and/or picnicking with a small stone edger wall indicating no lake access.

  The Rock Beach location would have two separate access points, one of which would be ABAAS compliant with a ramp to the beach and lake edge. Two sets of existing mortared stone steps to the beach would be replaced with stone steps with more appropriate character and longer durability.

- **Gateway Plaza (Figures 7 and 8)**. This plaza feature delineates the end of the lake front walk system and the beginning of the more rugged lake-side and backcountry trail system (Figure 8). As such, this area would represent a decision point for visitors considering a journey to the backcountry. Interpretive, informational, and route-finding elements would be provided in this area. A separated boardwalk to the east boat dock is proposed to divide boat queuing from bridge and trail hikers. The plaza, bridge, and boat dock access would all be ABAAS compliant. Materials are proposed to be regional stone and concrete.
- **Boat House Overlook and Beach (Figure 8).** The trail from the west end of the Gateway Bridge to the Boat House Overlook and beach would be re-graded to be ABAAS compliant. Currently, this area represents the limit of ABAAS compliance within the South Jenny Lake developed area. The trail surface in this area would be asphalt or other ABASS compatible material. Stone edging and/or natural log edging would be provided to delineate the trails and provide natural seating. Interpretive signs and wood benches would be added to the area.
- **Reimer's Path and Tank Relocation (Figure 5).** The existing road from the Reimer's Cabin parking area to the fuel tank would be narrowed and reconfigured to a "T" intersection into the Jenny Lake Trail intersection, making the southwest Jenny Lake Trail the direct intuitive route. Access would still be maintained from the bridge to the Reimer's parking area for emergency evacuations. The 15,000-gallon fuel tank would be relocated from the west side of the boat dock to the parking area to eliminate conflict between trail users and trucks. Disturbed soils would be decompacted and vegetation would be reintroduced. The concession parking area would be delineated with natural logs.
- **Creek Walk (Figure 7).** The Creek Walk provides access from the west Jenny Lake parking lot and would be widened to provide vehicle access to the Gateway Plaza. Improvements to the west entry would include welcome and route-finding signs and the elimination of redundant walkways to clarify the entrance. The non-historic cobbled walls would also be eliminated and the terrain re-graded. If walls are required, they would be more characteristic of the historic CCC design.
- **Cottonwood Creek Beach (Figure 5).** In the Cottonwood Creek Beach area, a natural beach access area would be created where user-created erosion exists. The limits of the beach access area would be delineated with native logs, stone walls, and fencing. Asphalt would be removed and replaced with a raised causeway connecting the Exum Bridge to the parking lot.
- **Public Boat Launch (Figure 5).** A number of improvements are proposed in the public boat launch area. The trail crossing at the boat launch would be delineated with a raised, flat, native stone surface to alert vehicles of the trail crossing and associated safety concerns in order to reduce conflicts at this crossing. Boat parking would be relocated approximately 300 feet south to an area out of sight from the trail. Although the launch itself would not be improved to ABAAS, two ABAAS compliant parking spaces would be added. The redesign would have more natural physical barriers (such as logs and boulders) placed strategically to prevent resource damage and to ensure safe flow of vehicle and foot traffic.
- **South Jenny Lake Water and Wastewater Systems (Figures 9 and 10).** The water and wastewater systems are still undergoing schematic design; a VA/CBA was conducted on October 25, 2013 to assist in selecting the most preferred components and general locations of installation for all utilities. Geotechnical investigations are required to assist in furthering

the design of the new water and wastewater systems, as well as the proposed Jenny Lake overlooks, restroom building, and bridge extension. A contracted geotechnical firm would dig a series of pits to perform tests and analyze the subsurface soils in the locations of the proposed improvements that are planned for construction in 2015-2017. Design calculations and construction techniques would be determined by the results of the investigation.

- ***South Jenny Lake Wastewater System (Figure 9).*** In order to meet the needs identified, the following features would be required: replacement of the existing 6,400 gallon septic tank serving the South Jenny Lake developed area with new septic tanks with capacities of approximately 20,000 gallons and 10,000 gallons; replacement of approximately 980 LF of existing sewage lines from the septic tanks to the leach field; replacement of 1,000 LF of existing infiltrator pipe in the leach field, and installation of 1,470 LF of new infiltrator piping to meet necessary capacity increase requirements. The proposed additional septic tank volume and corresponding infiltration piping would meet WYDEQ and EPA requirements. The existing septic tank would be demolished and removed. Surface restoration, including repaving and revegetation, would occur in all areas that are disturbed as a result of wastewater system upgrades, including 2.5 acres of revegetation.

  Various work elements would include: excavation; abandonment and/or demolition and disposal of old piping; installation of new piping and appurtenances; backfilling and compaction; and revegetation of areas disturbed by construction activities. Surface restoration, including repaving and revegetation, would occur in all areas that are disturbed as a result of wastewater system upgrades, including 2 acres of revegetation.

- ***South Jenny Lake Water System (Figure 10)***. For the South Jenny Lake water distribution system to continue to support visitor services, park and concessioner employees, and residents, and to meet state drinking water standards and fire suppression codes, the following is required: replace heavily corroded undersized water piping with new pipe and fire safety code-compliant hydrants; replace approximately 2,645 LF of 2-inch and 1,236 LF of 4-inch galvanized steel water line with new pipe sized for current needs; replace nine existing domestic hydrants in the campground with new domestic hydrants equipped with backflow prevention devices; replace four pump-out drains with new pump-out drains to facilitate seasonal draining of the system; and either enlarge the existing pressure/chlorination building or replace it with a new 30 foot by 20 foot building.

  Two design alternatives are being considered for meeting potable and fire suppression requirements: dual water systems and a combined water system. Dual water systems would have two un-connected water systems, one with treated water for domestic use and one with untreated water for firefighting use. Within this alternative there are multiple potential solutions including installing a dry hydrant with a pipe extending approximately 1,100 feet from the plaza to the lake ending at a screened inlet. Another option for a dual system configuration is to have an underground cistern adjacent to the plaza. Both alternatives would have a standpipe adjacent to the parking lot for the fire department connection. The second alternative, a combined water system, would include installation of up to three potable water tanks providing storage for up to 111,000 gallons of water from the domestic water supply, which could also be used in the event of a fire.

Various work elements would include: excavation; demolition and disposal of old piping and valves; installation of new piping, valves, and appurtenances; backfilling and compaction; and revegetation of areas disturbed by construction. Surface restoration, including repaving and revegetation, would occur in areas disturbed as a result of water system upgrades, including 38,000 square feet of repaving and 2.3 acres of revegetation.

- **Exum Complex.** The vault toilet serving the Exum complex would be relocated to a previously disturbed, WYDEQ compliant location elsewhere in the complex away from the new water system components.
- **Jenny Lake Campground.** Four campsites and the historic comfort station in the Jenny Lake Campground would be made ABAAS compliant. This would involve enlarging the parking spaces for the selected campsites, changing the fire rings and bear boxes, enlarging the tent pads, creating formal trails from each site to the comfort station, changing the comfort station to include accessible stalls and fixtures, and adding accessible parking space next to the comfort station. All of these areas would have an accessible surface. In the long term, another comfort station may be added at the northern end of the campground.
- **Jenny Lake Overlook (Figure 11).** The concrete and stone stairs at the Jenny Lake Overlook would be replaced with large dry-laid boulders, characteristic of the historic CCC era. Walls would be replaced so they are stable and require minimal maintenance. A stable long-term hillside embankment characteristic of the historic CCC era would replace the existing failing embankment. Large well-anchored retaining walls of natural dry-laid stone that blend with their surroundings would be reconstructed in the area and new ABAAS compliant paths would be constructed that allow access to the lake. The new disturbance would be approximately 8,400 square feet. The existing lakeshore access trail and walls would be demolished and the area would be restored and revegetated; approximately 5,000 square feet of area would be restored. Ramps and curb cuts would be constructed in the parking lot to provide ABAAS compliance.
- **String Lake Outlet (Figure 11)**. The trails that approach the String Lake Bridge from both east and west would be better aligned, defined, and contained, in order to reduce extensive compacted soils and sedimentation in the runoff. The existing horse fords would be improved to minimize erosion into the outlet. Unnecessary asphalt/concrete pads would be removed and bare areas outside the trail system would be revegetated with native plant material. The park is currently considering ways to create additional parking within the parking lot boundary in this area without increasing the size of the disturbed area, as well as determining the need for an additional vault toilet.
- **Vista Clearing**. Overlooks throughout the project area, both existing and proposed, would be routinely cleared to maintain the views for which they were intended. All vegetation removal would follow the guidelines and mitigations set forth by park management. Routine clearing would occur on a cyclic basis, every two to five years, and would be conducted by the park's facilities management division in consultation with park landscape architect or vegetation biologist.

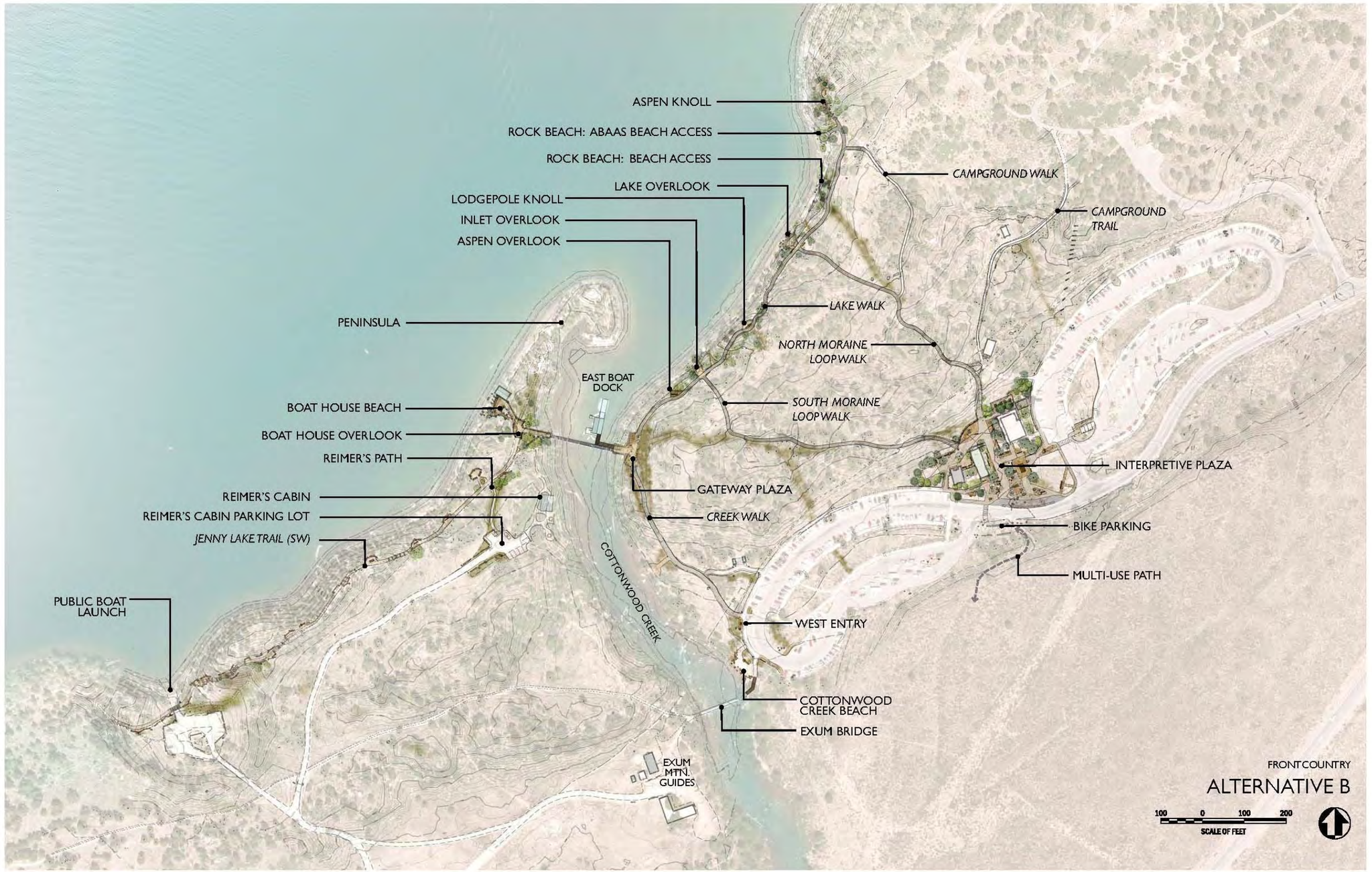


Figure 5. Alternative B, Overall Site Plan, Frontcountry

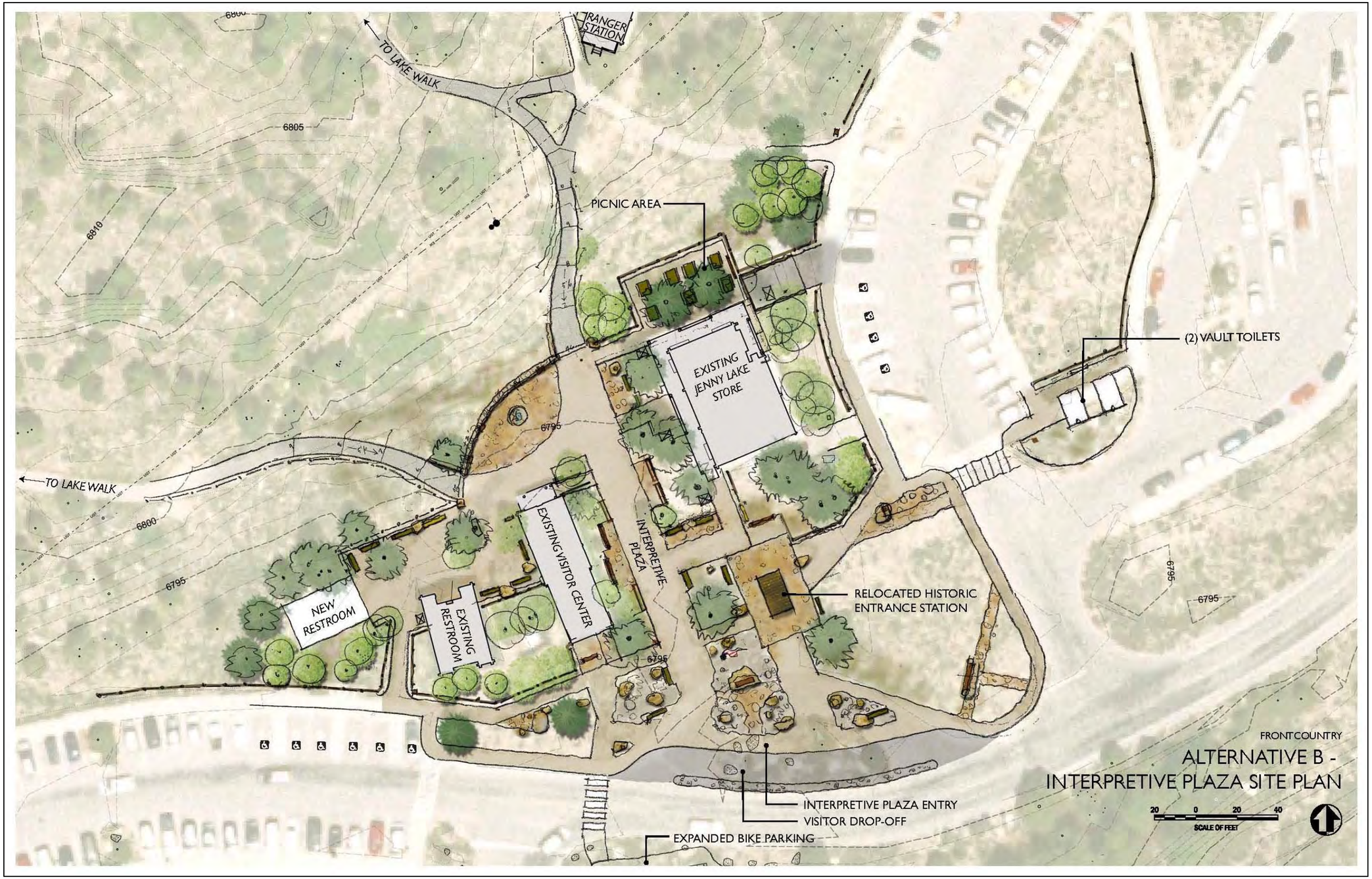


Figure 6. Alternative B, Interpretive Plaza, Frontcountry

Figure 7. Alternative B, Trails Plan, Frontcountry

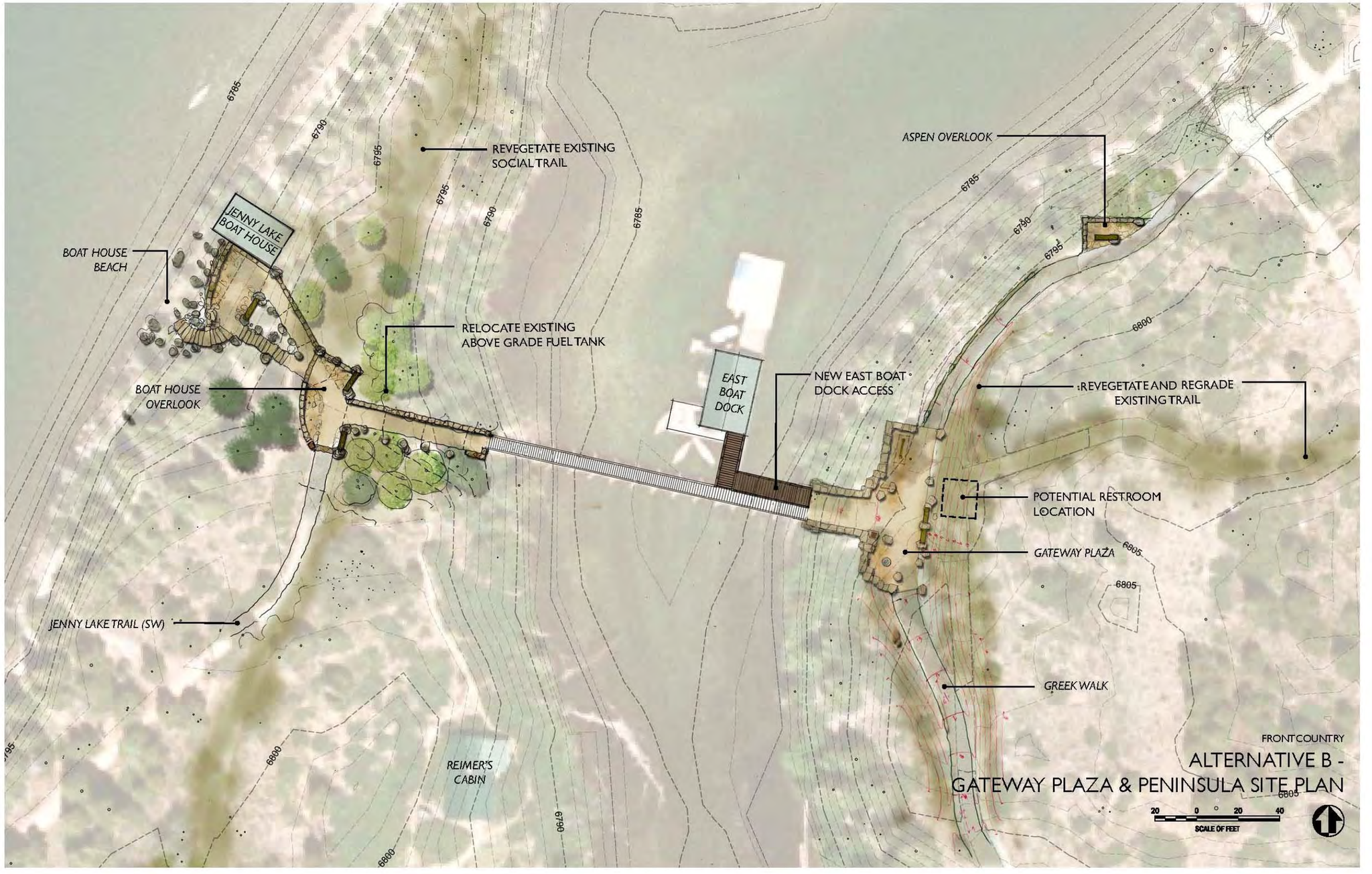


Figure 8. Alternative B, Gateway Plaza and Boathouse Area, Frontcountry

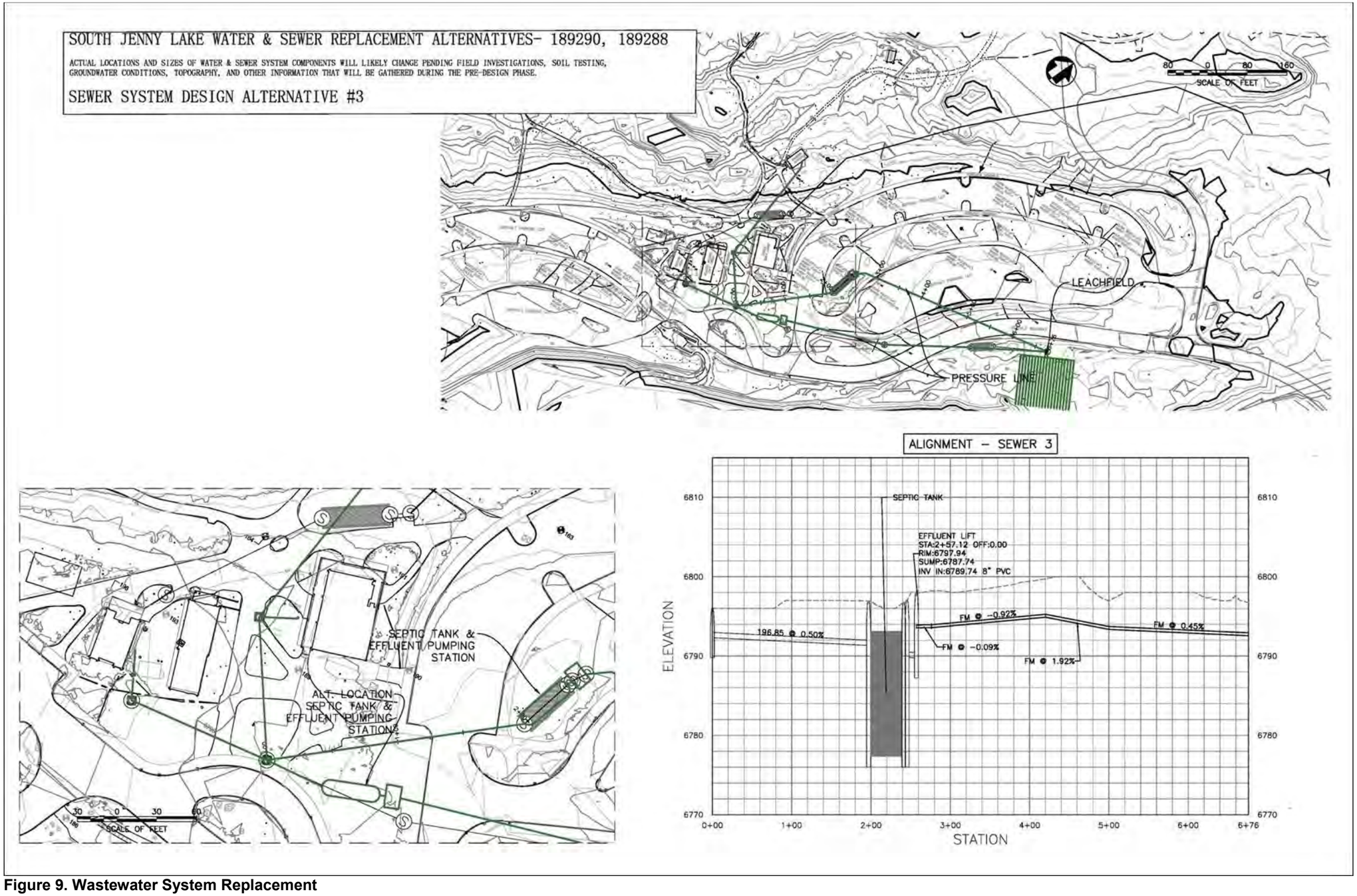


Figure 9. Wastewater System Replacement

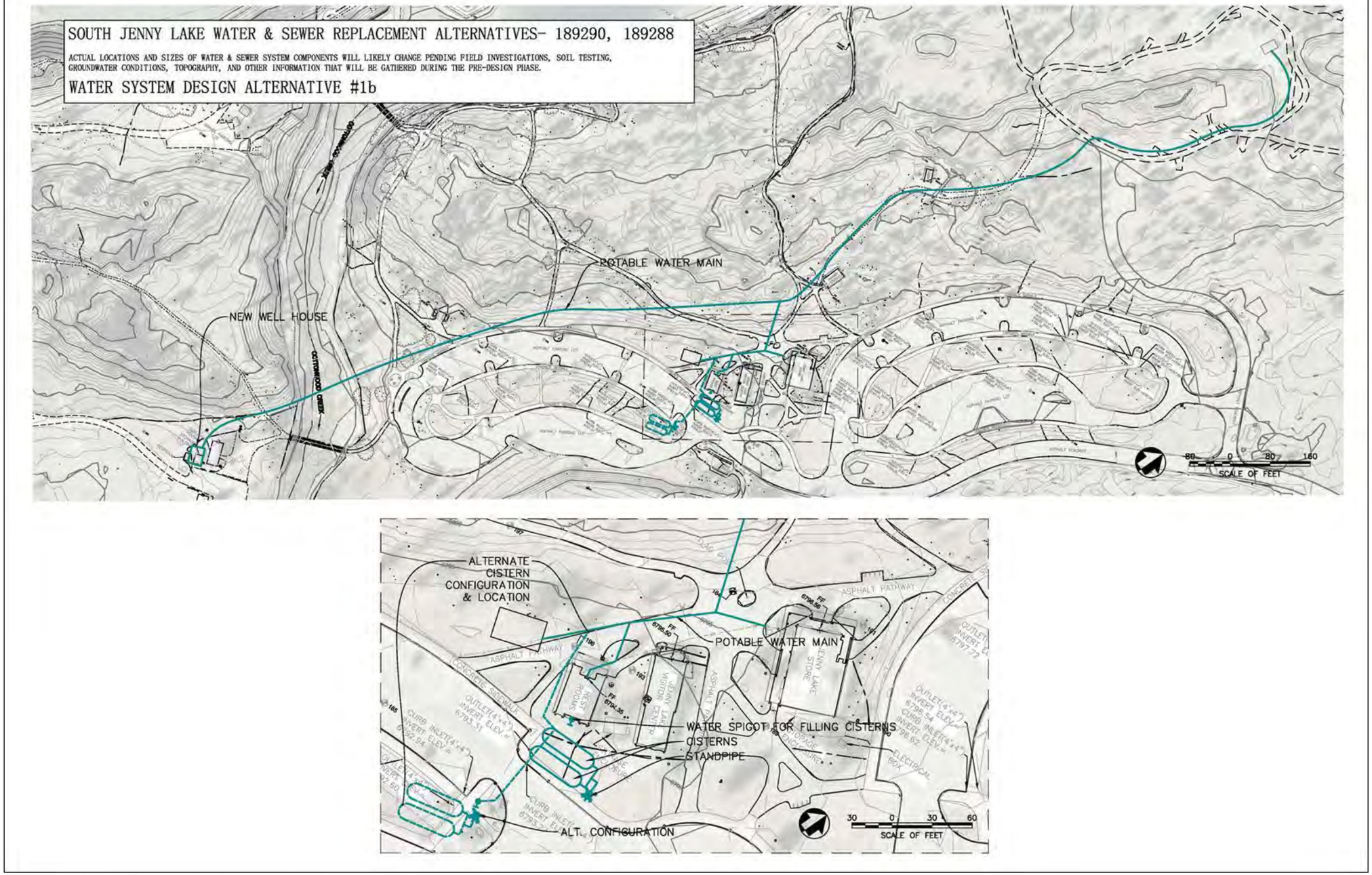
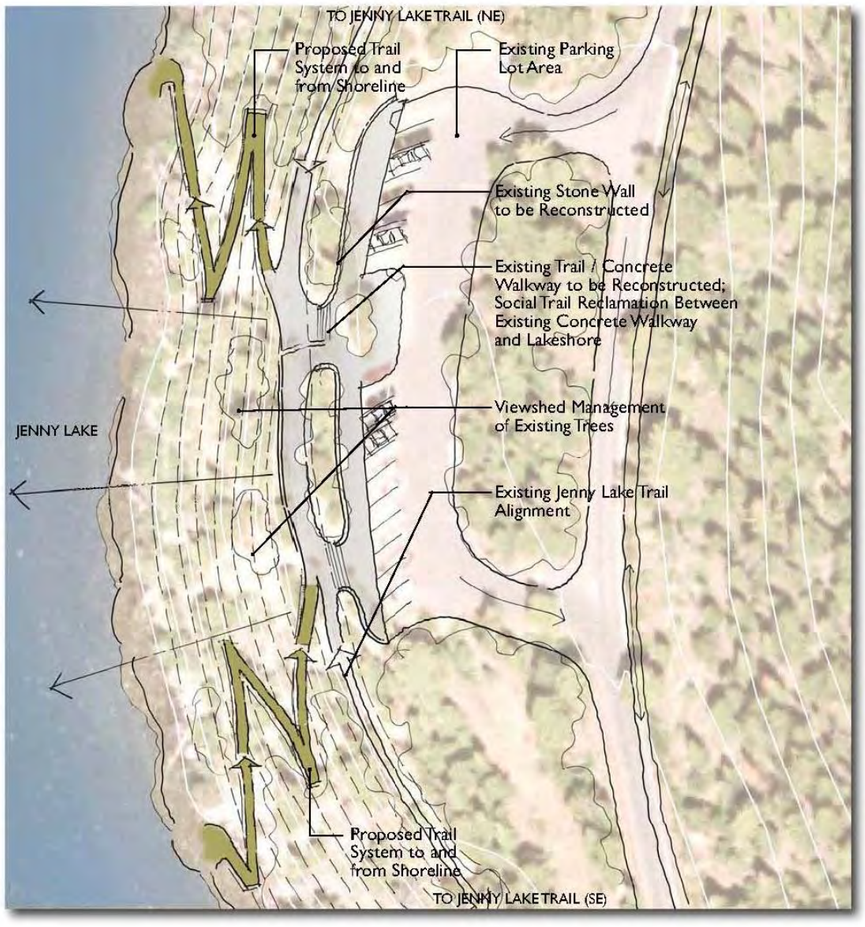


Figure 10. Water System Replacement



Alternative B
JENNY LAKE OVERLOOK

60 0 60 120

Alternative B
STRING LAKE OUTLET

60 0 60 120

Figure 11. Alternative B, Jenny Lake Overlook and String Lake Outlet, Frontcountry

Backcountry

The backcountry design and construction work includes rerouting and restoration of some trails, addressing circulation and crowding, and improving viewing areas. The backcountry effort encompasses all areas west of the public boat launch on South Jenny Lake around the lake to Hidden Falls and Inspiration Point. This effort includes the west boat dock, the Hidden Falls/Inspiration Point viewing areas, and associated trails in this area (Figure 12). Specific details about the proposed work are presented below in a generally clockwise order beginning at the west boat dock.

By policy, parks that have recommended wilderness have a responsibility to preserve wilderness values and must use a two-part minimum requirement analysis process to effectively analyze all proposed administrative actions that may affect wilderness character and values. This is integrated with, and supplemental to, NEPA, the National Historic Preservation Act (NHPA), and other compliance requirements. Motorized transportation, including helicopters, and mechanized tools and equipment, would only be used when determined to be the minimum tool needed to successfully accomplish the project.

- **West Boat Dock (Figure 12).** The west boat dock is the first feature that visitors arriving via the commercial boat service encounter in the backcountry. Through education, one-way, clockwise travel would be encouraged from this location to trails in the backcountry. The new circulation would be designed to be a complete, intuitive, self-guiding loop system. This would reduce crowding and improve opportunities for solitude. This new one-way circulation would require queuing to occur on the boat dock. To accommodate this, the square footage of the boat dock would be increased to approximately 1,200 square feet (from approximately 420 square feet currently). The entire existing dock, including the substructure, would be replaced. The new, larger dock would provide ample waiting room for visitors unable to hike the trail, with available space for queuing that accommodates wheel chairs and other seating. Part of the dock would be floating with a new substructure constructed with micro-pilings augered into the bedrock, piers set on the pilings, and steel beams on the piers. The wooden staircase would be replaced and eroded soils and denuded vegetation around the queuing area would be curtailed with the addition of retaining structures. Several areas of the trail would be widened and rustic dry-laid native boulders/stone retaining walls and natural seating areas would be added for visitors waiting for the boat.
- **Dock Bypass/Stock Trail (Figure 13)**. The addition of a new spur trail to the north would provide a bypass trail that would separate the uses of stock and/or through hikers (those hiking around the lake but not going to Hidden Falls or Inspiration Point) with hikers queuing for the boat. The purpose of this trail is to give users a route to access the southern Horse Trail from the southwest Jenny Lake Trail or to complete the loop around the lake without going up the Hidden Falls Trail. This would also provide a short loop hike to Cascade Creek Overlook and bridge, and then back to the boat dock.
- **Cascade Creek Overlook and Bridge (Figure 13).** This bridge would replace the existing bridge at Confusion Junction. The existing bridge (approximately 30 feet in length with a lifespan of five to 10 years) would be removed. The proposed design moves the location of the bridge and eliminates Confusion Junction (Figure 13) from the trail network. The new bridge would be approximately 53 feet in length and have a lifespan of 50+ years. It would be relocated approximately 100 feet to the east (downstream) in a more sustainable location

because it is higher above the creek and would be less likely to be washed out in high water years. The design, which would accommodate horse traffic, requires a new elevated trail with retaining walls to be created from the south side of the new bridge abutment that would link to the existing trail to the south. The new bridge could become a destination in itself, as it would overlook a deep cascade-filled canyon.

- **Confusion Junction Reroute (Figure 13).** Four trails currently merge at "Confusion Junction," a popular creek viewing area, half way between Hidden Falls and the boat dock. Although the space is defined by buck and rail fencing and large boulders along the creek edge, it is a large impacted area where human and horse uses converge. Once a visitor arrives, there is confusion as to where to go next. Soil and vegetation resources at the knoll of this area and along the creek are severely impacted with large areas of bare ground and exposed roots. Under this alternative, the trail would be re-routed and located on the south side of Cascade Creek and northwest of Confusion Junction. As part of this re-route, the Cascade Creek Bridge (see above) would be relocated, and the area would be restored to its natural condition. A spur trail to the south side of the former bridge would remain, to provide a creekside overlook and seating area that would be accessed via the existing trail along the south side of the creek. The existing impacted areas and four trails extending out from the junction would be reclaimed.
- **South Cascade Creek Trail and Hitching Post (Figure 13).** Erosion control and trail repairs are proposed along the central trail segment on the south side of Cascade Creek. The west end of the South Cascade Creek trail includes a horse hitching post site that is heavily impacted from years of use. The project would decrease the size of this bare ground area by installing natural barriers around the area to prevent further degradation and to close off user-created trails down to the creek. The impacted areas beyond the barriers would be revegetated. The plan would also build a causeway over the roots of a large Engelmann spruce tree and replace an existing culvert that drains the wet hillside.
- **Hidden Falls Overlook (Figure 14).** Congestion in the Hidden Falls area would be addressed by adding a new spur trail that would allow visitors to enter the area from the slope behind the viewing area (to the south) and encourage one-way circulation. The new trail, at a slightly higher elevation than the Hidden Falls Overlook, would enter the area from above, with the overlook located at the end of the trail. The new trail also allows visitors a place to queue before arriving at the overlook. The new spur entry trail would originate approximately 100 feet to the east of the viewing area. The existing trail (at the new spur junction) would be slightly realigned and signed so that hikers would follow the new spur trail for entry to the Hidden Falls area. The existing entry trail would be utilized as the exit trail. This alternative would also provide an improved surface at the overlook and a less intrusive barrier (native boulders instead of buck and rail fencing) to separate the overlook from Cascade Creek. The surface area of the overlook would be improved and additional natural seating opportunities would be provided.
- **Hidden Falls Bridges (Figure 14).** The two bridges between Hidden Falls and Inspiration Point would be replaced. The existing bridges have a lifespan of only five to 10 years and would be replaced with bridges with a much longer lifespan (50+ years). A natural stone surface would be applied to the area between the two bridges with native boulders to provide natural seating opportunities.

- **Inspiration Point Trail (Figure 15).** This segment of trail is located between Hidden Falls and Inspiration Point and includes Rendezvous Point, a steep area located midway up the Inspiration Point Trail. Throughout this area, existing drains and water diversions (checks) in the trail would be repaired and updated, and new checks would be installed in order to repair erosion-caused gullies, generally improve the trail conditions, and prevent future erosion. Large quantities of stone and fill would be required to properly repair the large gullies in the lower portion of this trail segment. In the Rendezvous Point area there is a narrow and failing system of steps and water erosion bars. The upper portion of the trail is extremely rocky with an uneven surface and some large steps. This section would be kept mostly in its present state because it provides a challenge to visitors and enhances the visitor wilderness experience of the area. Checks would be added to reduce erosion at the bottom of the trail segment and to make the trail surface more uniform. A CCC-era retaining wall in this area would also be repaired and stabilized.
- **Inspiration Point (Figure 15)**. The main trail that passes through the Inspiration Point area and continues into Cascade Canyon would be better defined to eliminate confusion. An existing user-created trail located at an elevation below the main trail would be made official and signed as the Inspiration Point Viewing Trail. This loop trail would pass added small boulder seating/viewing areas that would provide visitors a place to rest. Other user-created trails would be closed and rehabilitated. Native stone boulders would be imported or relocated from on-site to provide seating in these viewing areas and define limits of impacts. Imported stone would blend with other rock located throughout the area. Work in this location seeks to encourage visitors to use the viewing areas via the trail rather than traveling on vegetation and further degrading natural resources.

  From Inspiration Point, visitors have the option of hiking farther into Cascade Canyon and the backcountry (which is outside the project area) or returning back down the Inspiration Point Trail to the junction of the North Cascade Creek Trail. Returning to the boat dock via the North Cascade Creek Trail would be encouraged to further promote the clockwise circulation pattern.
- **North Cascade Creek Trail (Figure 12)**. This trail segment is located on the north side of the western portion of Cascade Creek. The majority of the trail structures are either constructed of timber or of stone that need repositioning and/or widening. Treatments proposed in this segment include construction of a retaining wall, causeway, water bars, new steps, and erosion checks.

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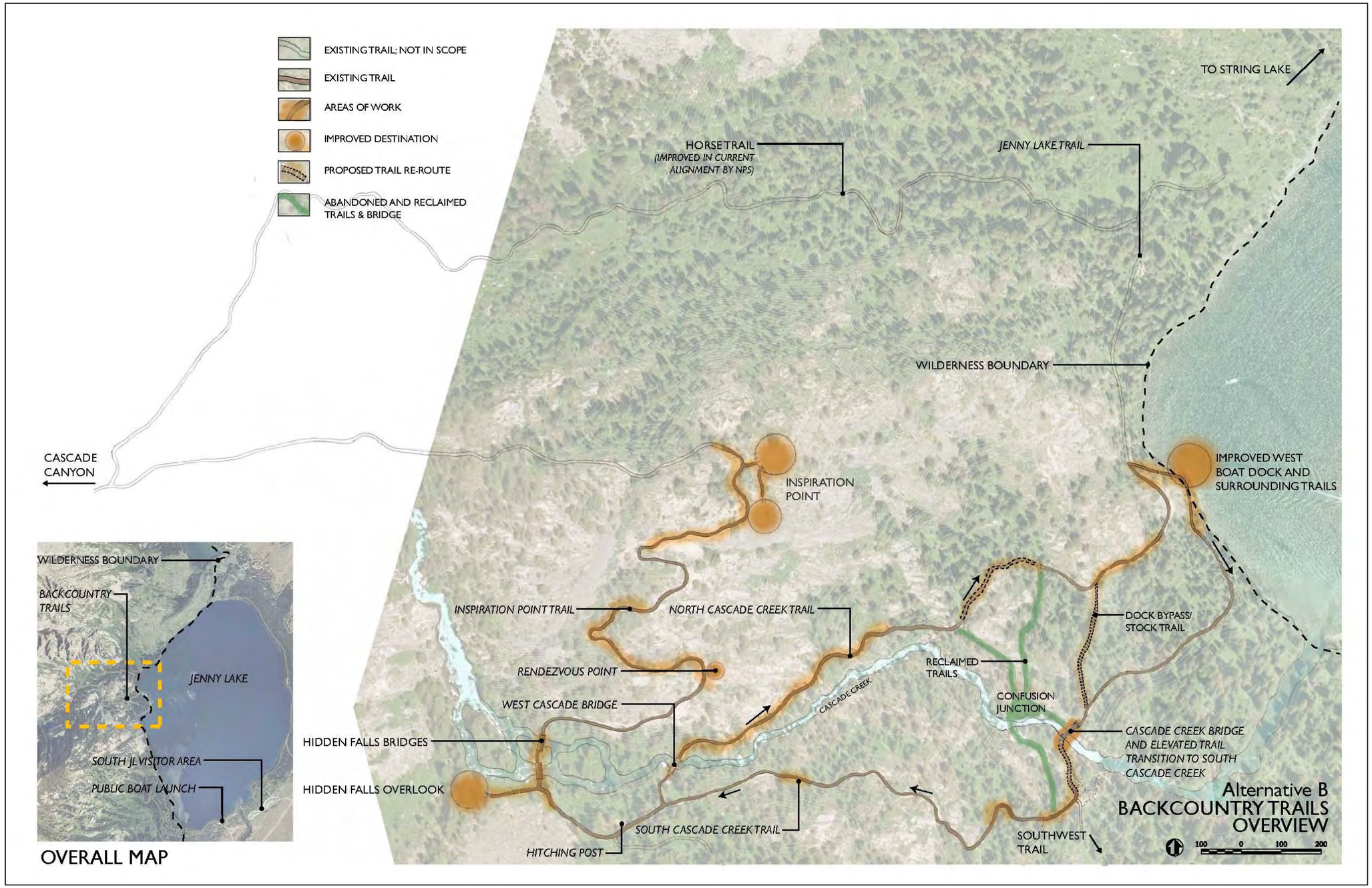
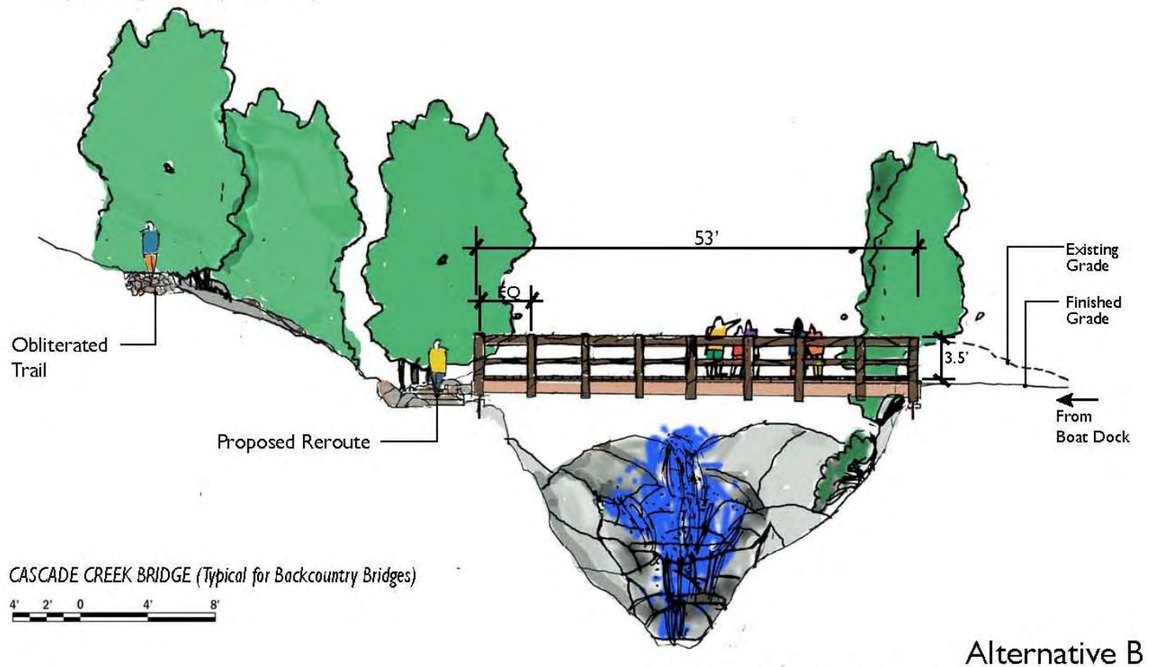


Figure 12. Alternative B, Trails Plan, Backcountry

Proposed Bridge Location (Western View)



Alternative B
CASCADE CREEK OVERLOOK

Figure 13. Alternative B, Cascade Creek Overlook, Backcountry

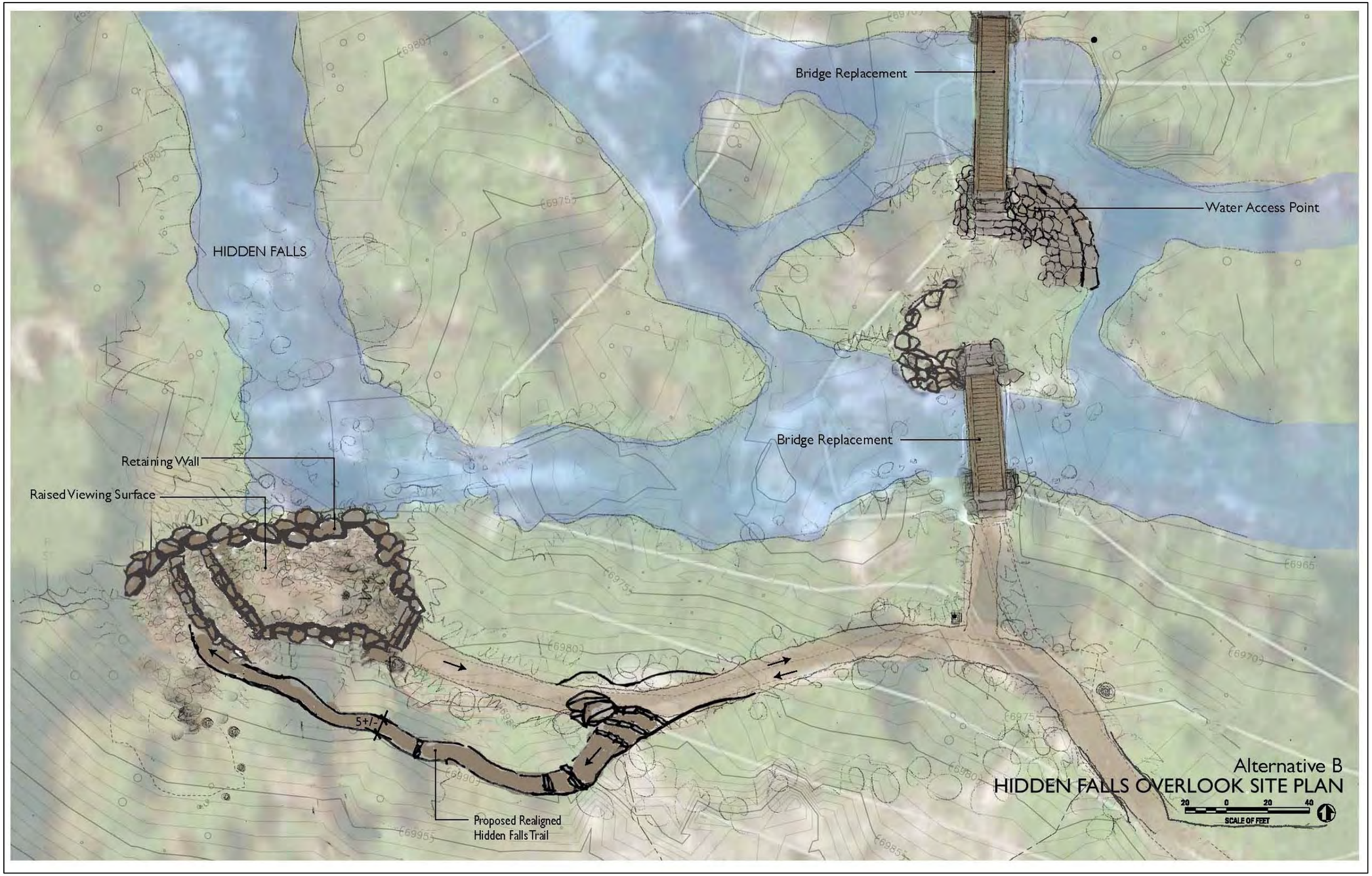
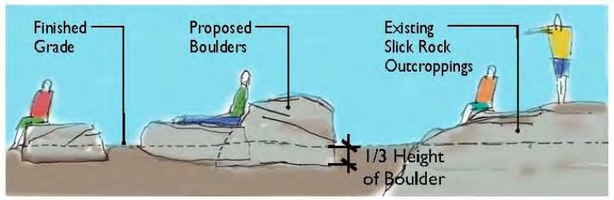
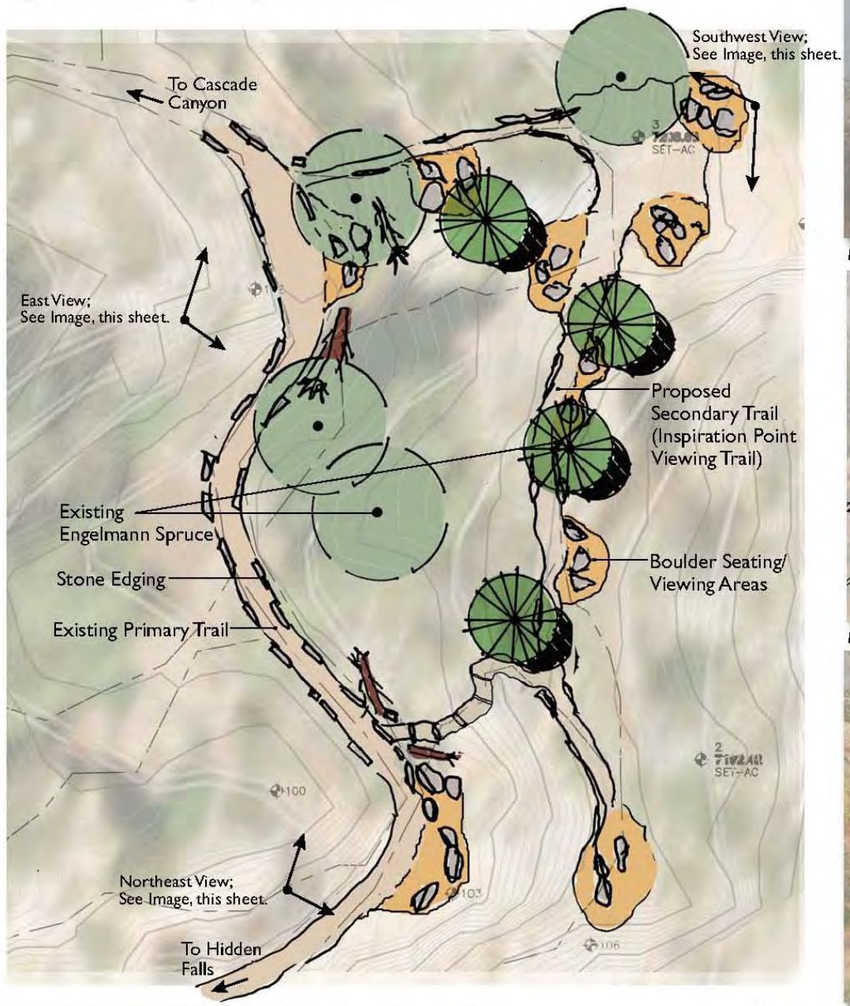


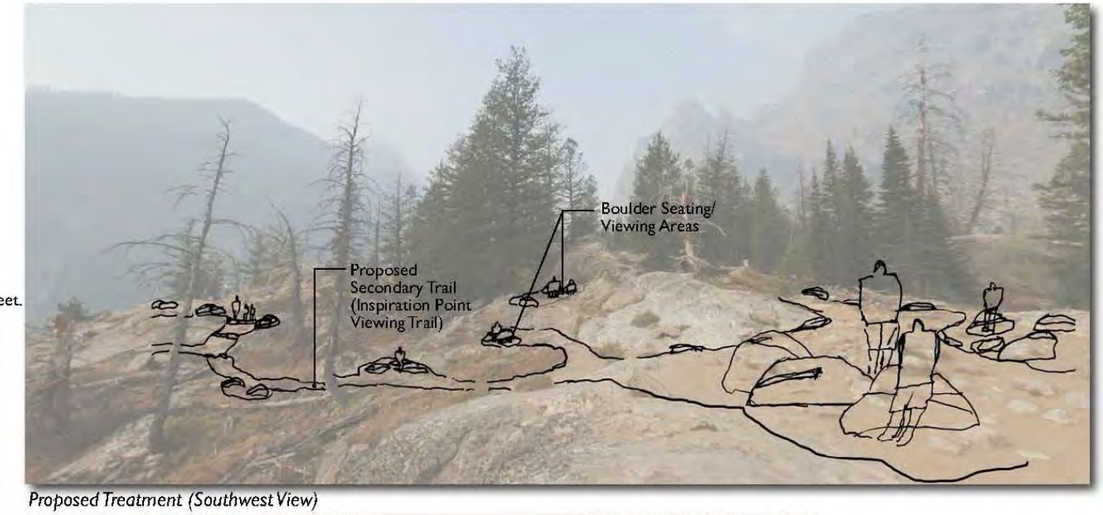
Figure 14. Alternative B, Hidden Falls Area Plan, Backcountry



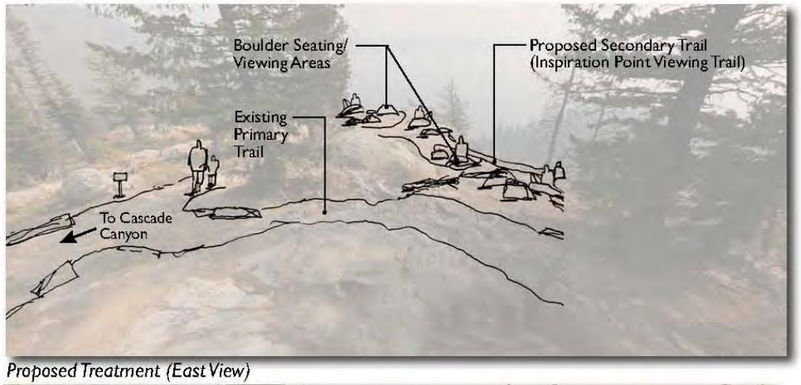
Typical Boulder Seating/Viewing Areas 4' 2' 0 4' 8'



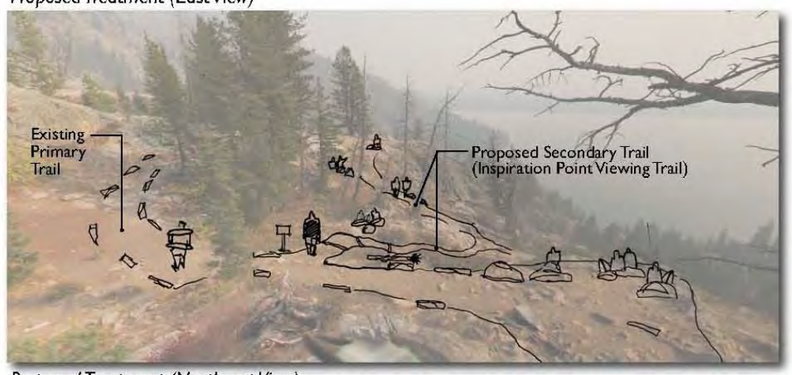
INSPIRATION POINT PLAN 20 0 20 40



Proposed Treatment (Southwest View)



Proposed Treatment (East View)



Proposed Treatment (Northeast View)

Alternative B
INSPIRATION POINT

Figure 15. Alternative B, Inspiration Point, Backcountry

Alternative B Construction Details

The construction phase would be anticipated to last from three to four years. Oversight, quality control and management of this project would be provided by the Denver Service Center, park-based project management branch staff, the park's trails supervisor, vegetation staff, cultural resource management staff, wilderness staff, interpretive rangers, and trail crew leaders who have attended extensive technical masonry training.

Frontcountry. Geotechnical investigations are required to assist in the further design of the new water and wastewater systems, as well as the proposed Jenny Lake overlooks, restroom building, and bridge extension. Design calculations and construction techniques would be determined from the results of the investigation.

Once all designs are complete, frontcountry work would be contracted. Work would mainly occur during the work week between the hours of 7 a.m. and 5 p.m. Construction sequencing is critical to allow maximum access for visitors and concessioner operations to Jenny Lake and associated trails during construction. Construction activities would be phased so that visitors' recreational use of the area would not be overly restricted. Phasing would occur over the course of approximately three to four years; breaks may be taken during bad weather. Destinations would still be accessible to the greatest extent possible and disruptions to concessioner operations would be generally minimal. Minor reroutes of trails would occur during construction. The coordination of utility line installation would precede the completion of the new comfort station to ensure water and wastewater systems are available. The provision of bypass routes and/or phasing of the construction at central areas of South Jenny Lake, would maintain visitor access to park and concession-operated facilities. Construction would maximize use of shoulder season times (April and mid-September to mid-October).

Backcountry. Park crews would implement the project in the backcountry. Construction of this scale in recommended wilderness (that involves transporting construction materials to the site, harvesting local materials for use, staging materials, and complying with minimum requirements), while maintaining continuous visitor access to the site during construction, requires detailed planning. Motorized carts and wheelbarrows, generators, electric tools, and helicopters would be used to transport materials to project staging areas. Helicopters would transport stone and gravel as well as steel beams and wood for bridge and dock reconstruction. Current estimates of quantities of material required for the backcountry portion of the project indicate potential helicopter flights would occur continuously for approximately two weeks a year (approximately 40 drops a day) – one week in the spring and one week in the fall, for three or four seasons, depending on weather, material availability, etc. Additional tools and supplies would be transported by barge and pack animals.

The images in Table 2 represent an example of a proposed backcountry action in a before/after format. This example is located on the trail between Inspiration Point and Hidden Falls where erosion checks are proposed to treat a gully. It is anticipated that proper treatment would require a total of 18 checks, eight of which are depicted on the Proposed Treatment image. Each check would require approximately four to six granite stones to form the tread and riser; each stone is roughly 2 feet by 1 foot by 2 feet in size. The stones would be partially buried below grade at a minimum of 1/3 of the stone height. Eight cubic feet of crushed stone (2-3 inch diameter) and 4 cubic feet of a soil/gravel mix would be placed in between the checks. The depiction in Table 2 represents approximately 9.5 cubic yards (18.5 tons) of material.

Table 2. Backcountry Conditions (Pre- and Post-Project).

	
Existing Conditions	**Proposed Treatment**

Material Weights
Granite Stone 4,590 lbs per Cubic Yard *
Crushed Stone 3,834 lbs per Cubic Yard*
Soil/Gravel Mix 3,645 lbs per Cubic Yard*
*Sources: Select Stone, Evans Construction, and Rocky Mountain Supply

Current estimates indicate the work in the backcountry would require three to four crews of up to five individuals per crew (15 to 20 people total). Motorized equipment used would include chainsaws, gas rock drills, and motorized wheelbarrows. This equipment would be used intermittently during a 10-hour work day throughout the duration of the proposed project. Structures and installations in recommended wilderness would include waterbars, turnpikes, steps, retaining walls, and culverts. The number, location, and size/scale of these structures and installations would be kept to the minimum necessary for visitor safety and resource protection. The park intends to execute the majority of the design and construction effort for the backcountry using government in-house resources (in-house landscape architect, day labor trail crews, and government-procured materials). For a more detailed analysis of the projected backcountry work, see the attached Minimum Requirement Decision Guide in Appendix A.

Revegetation

Vegetation management associated with both backcountry trail reclamation and revegetation of disturbed trailside and other areas would follow a similar process. Prior to construction, disturbed areas would be surveyed for non-native plants and control measures would be initiated. As construction commences, existing topsoil would be conserved. Following construction, soil would be decompacted to the average rooting depth of adjacent plants, large (>3 inch) debris and

rocks removed from soil, and topsoil replaced. Revegetation efforts are driven by NPS policy that dictates that all revegetation efforts utilize locally occurring, genetically appropriate native plant materials; therefore, areas would be surveyed and then native seed or other plant materials would be collected in areas adjacent to the planned reclamation and trail work areas. These plant materials would be processed and tested for viability prior to utilization. Following soil disturbing activities, these native plant materials would be planted and non-native plant treatments would be initiated. Non-native plant control measures would be sustained for a period of three years or until non-native plants are controlled and native plants are re-established.

Backcountry Trail Reclamation. The majority of the trail reclamation areas along the south and west sides of the Jenny Lake trail system are narrow disturbances of compacted ground within the trail width and length (or trail "tread") with adjacent intact native plant communities. Compacted soils can have negative ecological effects, including alterations to local hydrology and increased soil erosion. Highly compacted soils postpone or prevent native plant recruitment and often result in an environment that facilitates exotic plant recruitment and successful growth. To facilitate revegetation, the soils in the trail tread would be physically decompacted; topsoil would be imported for denuded areas that are eroded; the decompacted soil not within the trail would then be seeded with a native seed mix; and non-native plants would be treated for a period of up to three years or until the populations are controlled and native plants re-establish. Seed application would occur via hand broadcasting and manually raking seed into soil to maximize seed-to-soil contact. Non-native plant treatments would be conducted with manual removal and backpack and horseback herbicide spray crews.

Trailside and Staging Area Vegetation Management. The highest diversity and density of non-native plants in Grand Teton National Park occur along travel corridors. Several aggressive non-native plant species have been identified in the Jenny Lake project area. Trail work that affects existing adjacent vegetation would likely result in increased spread and recruitment of these non-native plants. Following construction activities, all material staging areas and disturbed trailside areas would be treated for non-native species, and native seed would be hand seeded and raked into exposed areas. Trailside vegetation management is intended to re-establish native plant cover as quickly as possible. Rapid native plant development can help to minimize non-native plant recruitment and development, has ancillary positive effects on visitor aesthetic experience, and can address issues of increased soil erosion associated with construction activities. Non-native plant treatments would continue for three years or until the non-native plant populations are controlled and native plants are re-established. Non-native species treatments are especially important in construction zones that are within highly visited areas such as the Jenny Lake trail system where visitors travel from non-native infested areas to or through newly disturbed areas.

Mitigation Measures Associated with Alternative B

Congress charged the NPS with managing the lands under its stewardship "in such manner and by such means as would leave them unimpaired for the enjoyment of future generations" (NPS Organic Act, 16 U.S.C. 1). As a result, NPS staff routinely evaluates and implements mitigation measures whenever conditions occur that could adversely affect the sustainability of national park resources.

Mitigation is defined in the Code of Federal Regulations (40 CFR 1508.20) as:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be implemented under the action alternative, as needed. The NPS may need to obtain federal and state environmental permits and, as part of that process, additional mitigation measures could be required by other agencies. The NPS commits to the mitigation measures identified in this section as a part of implementing the project. The impacts for the action alternative in Chapter 3 were determined with these mitigation measures in place, with tailoring to meet site-specific conditions.

General Construction Best Management Practices

Construction best management practices (BMPs) would be implemented, as appropriate, before, during, and/or after construction of the proposed improvements. BMPs specific to the design cannot be proposed until the full design is complete and specifics of the proposed construction are known. The construction practices listed below are subject to change and addition during construction to mitigate impacts to resources.

- All tools, equipment, temporary barricades and signs, surplus materials, and trash would be removed upon project completion. Any asphalt surfaces damaged due to project work would be repaired to original condition. All demolition debris (e.g., old water lines, appurtenances, water tanks, valves, packaging materials, trash) would be disposed of at appropriate areas designated by the park. When possible, debris would be disposed of at a materials recycling facility.

- To minimize unintentional introductions of non-native plants, all construction equipment and vehicles entering the park would be cleaned before entering park lands and certified as free of plant propagules and exotic soils by appropriate park staff.

- Construction zones would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the defined construction zone.

- To minimize the amount of ground disturbance, staging and stockpiling areas would be in previously disturbed sites, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following work. Parking areas for construction vehicles would be limited to staging areas, existing roads, and previously disturbed areas.

- Revegetation and recontouring of disturbed areas would take place following construction and would be designed to minimize the visual intrusion of the disturbance. Revegetation

efforts would strive to restore the natural spacing, abundance, and diversity of native plant communities. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. Vegetation disturbance would be prevented to the extent possible. Weed control methods would be implemented to minimize the introduction of noxious weeds.

- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as silt fences and/or sand bags would be used to minimize any potential soil erosion.
- A hazardous spill plan would be in place, stating what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc. Any spills of hazardous materials would be immediately reported to the park safety officer.
- Where appropriate and available, "environmentally friendly" grease, hydraulic oil, and bar and chain oil would be used. These lubricants are vegetable- or mineral-oil based, and biodegradable.
- Power wash equipment and/or vehicles before and after use to prevent the introduction and transportation of exotic plants.
- Dust abatement measures would be employed to reduce fugitive dust (including setting speed limits for construction vehicles in unpaved areas). Dirt and debris to be hauled away in trucks would be covered. Dust generated by construction would be controlled by spraying water on the construction site, and/or applying other approved chemicals or compounds to reduce dust, if necessary.
- To minimize air and sound pollution associated with construction activities, limit warm up, cool down, and idling of construction equipment to the minimum durations recommended in the equipment owner's manual, taking into consideration ambient temperatures and other factors.

Cultural Resources

- NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.
- Actions proposed in Alternative B will adversely affect historic structures, cultural landscapes, and archeological sites within the Jenny Lake area (an adverse effect is found when an action may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association). Prior to implementing the action alternative, an appropriate mitigation strategy would be developed in consultation with the Wyoming State Historic Preservation Office (SHPO) and, if necessary, the Advisory Council on Historic Preservation (ACHP). Mitigation agreed upon would be outlined in a memorandum of agreement negotiated among the NPS, SHPO, and ACHP, and consulting parties as necessary. Any mitigative

documentation would be prepared in accordance with section 110 (b) of the NHPA, and the documentation submitted to the Historic American Buildings Survey / Historic American Engineering Record / Historic American Landscape Survey program.

- Continue coordination with a NPS archeologist before any ground disturbing activities.
- In the event that archeological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if the resources cannot be preserved in situ, an appropriate mitigation strategy would be developed in consultation with the SHPO and, as necessary, American Indian tribes.
- In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.
- The trails supervisor must ensure that routine maintenance undertakings have no adverse effects to cultural resources. For work in or near historic districts, trails, or structures, consultation with the park cultural resources specialist and an Assessment of Effect may be required.

Natural Resources

Vegetation

Revegetation of disturbed areas would follow NPS policies as stated in *NPS Management Policies 2006* (NPS 2006c). These policies state that soil shall be conserved and structure and fertility restored, locally occurring native plant materials shall be used in restoration and revegetation treatments, and disturbance shall be minimized such that ecological integrity is maintained or restored. Specific soil and vegetation treatments would be detailed in a revegetation plan and in construction and implementation documents.

- Soil treatments would be tailored to each disturbance area. In trail reclamation areas, soil would be decompacted to a depth that would accommodate average rooting depth of common native plant species. In areas denuded of topsoil, appropriate soil would be imported and if necessary soil supplements would be imported as well.
- All disturbed areas would be revegetated with native plant materials. Native plant materials used in restoration would be those that are locally occurring and would be reintroduced such that the natural spacing, abundance, and diversity of plant species would be re-established.
- Work limits, travel paths, and staging areas would be designated and enforced to mitigate impacts to vegetation. Disturbance zones and construction and staging areas would be fenced or clearly marked to prevent impacts to resources outside the approved construction limits.
- In previously undisturbed areas where ground disturbance would occur, the Science and Resource Management Division would be contacted prior to work start to survey for and treat non-native plant species before any ground disturbance occurs outside existing or previously disturbed areas. Designers would provide information to the Science and Resource Management Division one growing season before planned disturbance if the affected area is

<1/4 acre and one or two growing seasons if >1/4 acre, to allow time to obtain enough plant material for revegetation efforts.

- Staging areas and project work areas would be surveyed for invasive non-native plants one to three years after project completion. Any trenching operations (e.g., installing and accessing water lines, replacing water storage tanks and vaults) would be located to minimize disturbance to established vegetation and avoid large diameter trees to the extent possible. Equipment would be used that allows the operator to detect the presence of tree roots prior to damaging them. Roots less than 4 inches in diameter would be given a clean straight cut to prevent root rot. When roots 4 inches in diameter and larger are encountered during trenching operations, they would be retained by hand-digging the trench beneath the root. As the trench is dug, the excavated material would be stored adjacent to disturbed areas. After trenching is complete, bedding would be placed and compacted in the bottom of the trench and the pipe installed in the bedding. Backfilling and compaction would begin immediately after the pipe is placed into the trench, and the trench surface would be returned to preconstruction contours.
- All trenching restoration operations would follow guidelines approved by park staff. These guidelines would minimize disturbance to soils and vegetation from construction activities, and would restore affected areas to their original form wherever possible. Further, once construction is completed and disturbed surfaces recontoured, erosion mats or other erosion control measures would be used to protect bare, exposed soils from erosion until revegetation takes place.
- Sources of rock, sand, gravel, earth, soil, or other imported natural material would be inspected for invasive non-native plants prior to acceptance. Materials may be rejected if non-native invasive plants are present at the source and seeds could be present in the material.
- All equipment, including hand tools, must be washed before use in the park. This is to ensure that all soil and potential exotic plant propagules are removed. Existing native vegetation would be salvaged and preserved to the extent possible for use in revegetating disturbed areas. Existing trees would be preserved to the extent possible. Pre- and post-project plant monitoring would be conducted in the project area to ensure successful revegetation, maintain plantings, and replace plants that do not survive. Invasive weed control measures would be implemented.
- Construction workers and supervisors would be provided with tree pruning guidelines to minimize damage to trees during project implementation.
- Horse and mule stock must be fed certified weed-free feed 24 hours prior to spending the night in the backcountry and while in the backcountry.
- Specific sites with known special status plant species present would be avoided.

Soils

- To minimize soil erosion at the project site, erosion control BMPs – including protection measures such as sediment traps, silt fences, erosion check screens / filters, jute mesh, and hydro mulch – would be used if necessary to prevent the loss of soil.

- Compacted soils would be scarified or de-compacted to a depth equal to the average rooting depth of dominant plants in adjacent plant communities and original contours re-established.
- Excavated or salvaged soil may be re-used within the project area. Topsoil materials would be stockpiled in a predetermined designated area away from excavations and future work sites and care would be taken to ensure that topsoil and subsoil or fill material are not mixed and are stockpiled in separate areas. Stockpiles would then be graded and shaped to allow unimpeded surface water drainage. Topsoil stockpiles would be no greater than 3 feet in height. Stockpiles would be temporarily seeded and periodically treated to prevent wind from scattering topsoil and to prevent the introduction of non-native plants. Live vegetation less than 3 feet in height and limbs less than 2 inches in diameter may be present in stockpiled topsoil. The soil to vegetation ratio shall not exceed a 10 to 1 ratio.
- Any fill materials would be obtained from a park-approved source approved by the Science and Resource Management Division. Borrow and aggregate materials from sources outside the park would be inspected to avoid importation of non-native plants.
- The contractors would control dust during construction by minimizing soil exposure, water spraying, and use of other dust prevention methods.
- If construction is not completed prior to a winter season, all disturbed areas and soil stockpiles would be protected from snowmelt impacts by using erosion-control BMPs and covering dirt piles with impermeable materials.
- Trails would be closed to stock use during periods of wet weather or due to other resource concerns.

Wildlife and Special Status Species

- In accordance with the Endangered Species Act (ESA), Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) would be completed prior to implementation of actions proposed in this EA. The park would implement all resulting mitigations.
- Potential rock harvesting sites would be surveyed by Science and Resource Management staff to assist in pika habitat avoidance.
- Under the Migratory Bird Treaty Act, no migratory bird, nest, or egg would be disturbed, removed, or destroyed. To minimize the potential for "taking" a nest of any protected bird species, park resource managers would survey the area before tree removal and/or ground disturbing activities commence to mitigate any potential issues in advance of site construction. To comply with the Migratory Bird Treaty Act, projects requiring vegetation removal between May 1 and August 1, or those requiring removal of large trees between March 1 and August 15, must be surveyed for nesting birds. Any active bird nests located during surveys must be protected until nestlings fledge or the nest fails. Park biologists would monitor such nests and provide updates to the project leader on nesting status. Work must take place within two weeks of survey; otherwise another survey must be done.
- Appropriate measures would be taken to reduce the potential for bear-human conflicts. All project activities must comply with the Grand Teton National Park Bear Management Plan guidelines for use and storage of food, fuels, and other bear attractants. All contractors and employees would be trained and required to comply with the park's bear management and food storage regulations during construction and rehabilitation activities. All project staff,

trainees, and other personnel would be briefed about food storage needs and bear safety protocols. Bear-proof garbage containers would be required. Food, fuel, and other attractants would be stored and handled to minimize potential conflicts (i.e., no food, garbage, drink, trash, or food and drink containers would be placed outside vehicles, trailers, or bear resistant containers except during times when they are being used). All bear-human confrontations and sightings would be promptly reported to resource management staff.

Water Resources

- To the extent possible, construction activities would be conducted during periods of low precipitation to reduce the risk of accidental hydrocarbon leaks or spills reaching surface and/or groundwater.
- Equipment would be inspected for fluid leaks, including hydraulic fluid and oil, prior to use on construction sites, and inspection schedules would be implemented to prevent contamination of soil and water.
- Stormwater treatment would be incorporated as part of the construction plans to provide engineering methods and techniques specific to the finalized design drawings, which would minimize soil erosion and degradation in the project area during both construction and use of the area. Site work in the frontcountry would incorporate stormwater pollution prevention into the plan using BMPs. If construction requires a National Pollutant Discharge Elimination System permit for stormwater discharges, then a Stormwater Pollution Prevention Plan would be prepared.
- Fabric barriers, straw bales, sandbags, block and gravel protection, etc., may be employed to create barriers. These barriers could be used in combination with other measures such as impoundments or sediment traps.
- Fueling and fuel storage areas would be bermed and lined to contain spills. Provisions would be made for the containment and disposal of oil soaked or contaminated soils (clay or plastic liners). Construction equipment would be regularly inspected and maintained to prevent any fluid leaks. Contractors would promptly clean up any leakage or accidental spills from construction equipment, such as hydraulic fluid, oil, fuel, or antifreeze.
- When construction is ended prior to a winter season, all disturbed areas and soil stockpiles would be protected from snowmelt impacts.
- Any activity that has the potential to alter stream flow characteristics or affect a watershed, wetland, or floodplain, must be submitted to the NPS for review.

Wilderness

- Natural materials would be used to repair or construct wilderness installations (e.g., water bars) or restore impacted areas to original condition.
- Minimize use of motorized and mechanized equipment by using hand and traditional tools as much as possible. The use of motorized equipment or mechanical means of transport would be minimized as outlined in the minimum requirement analysis.
- Follow vegetation, soil, and wildlife mitigations listed above.
- Eliminate installations designed solely for visitor comfort (seating benches and boulders).

- Minimize bulk and stature of bridge components, especially railings and deck width, to what is required for safety.
- Minimize tread and trail width to narrowest allowable.
- Confine lining or bordering trails with stones or other installations to those areas where no other means to delineate trail is possible.
- Minimize bulk and extent of fencing. Attempt to conceal fencing or other structures designed to limit access.
- Minimize use of motorized equipment and other noise making equipment. Use only motors equipped with functioning mufflers. Radio or other loudspeaker broadcasts is prohibited. Choose low noise equipment when possible. Minimize chainsaw use by precutting and prefabricating at frontcountry locations.
- Minimize signs that restrict or prohibit choices.

Natural Soundscapes

- Minimize use of motorized equipment and other noise making equipment.
- Only motors equipped with functioning mufflers will be used.
- Radio or other loudspeaker broadcasts is prohibited.
- Use of broadband or directional backup alarms is recommended.
- Use of backup alarms on motorized equipment in wilderness is prohibited. Use attendant spotter instead.
- Choose low noise equipment when possible.
- Minimize chainsaw use in backcountry by precutting and prefabricating at frontcountry locations.

Visitor Use and Experience

- During project implementation, visitors would be informed of construction activities via press releases, visitor center postings, and educational contacts. The park would provide information to visitors, concessioners, and employees of alternative routes and project schedule, including visitors and employees about opportunities in the adjacent Caribou-Targhee and Bridger-Teton National Forests.
- Temporary cautionary closure signs would be used on trails, roads, and facilities to protect visitors.
- The number, area, and duration of closures in the backcountry would be limited in order to maintain opportunities for solitude and primitive, unconfined recreation.
- Proposed actions that have the potential to impact visitor safety, access, or experience would be coordinated with the Interpretation and Ranger Divisions prior to work start. Dispatch would also be notified prior to work start.

- One lane of traffic would remain open during the installation of a new water line within South Jenny Lake. When delays are necessary, traffic would be released through the construction zone on the hour.

Alternatives (Actions) Considered and Dismissed

During the planning process, some additional alternatives and management actions were considered but eliminated from detailed study. The following alternatives and management actions were considered for project implementation, but were ultimately dismissed from further analysis. Reasons for their dismissal are provided with the following descriptions.

Alternatives considered but dismissed in the frontcountry included:

- **Additional Bathroom Alternatives.** In addition to those described previously, two other options were considered to address the need for more bathroom facilities in the Jenny Lake area: the expansion of the existing flush restroom building and replacing the existing flush restroom building. Both options would have required additional resource damage, including tree removal. In addition, the size of the building would have made it the dominant structure in the visitor center interpretive plaza.

Alternatives/actions considered but dismissed in the backcountry included:

- **Horse Trail Realignment.** An option was considered that would have realigned the Horse Trail to provide a gentler grade. This was dismissed due to the negative impact the alignment would have had on vegetation and the potential for this change to increase use in this area, which is an important wildlife corridor. Increased hiker use may have also caused an increase in stock-human encounters.
- **Cascade Creek Trail.** The alternative to decommission the South Cascade Creek Trail and widen the North Cascade Creek Trail to allow two-way circulation was dismissed due to the diminished visitor experience a widened trail would have, its questionable appropriateness in recommended wilderness, and the major adverse impact it would have on vegetation.
- **No Confusion Junction Re-route.** One option considered continuing to route two-way traffic through Confusion Junction. This was eliminated from further consideration because of the degradation of resources already occurring in this area in addition to the confusion experienced by visitors who come to this area.
- **Cascade Creek Bridge.** This option would have replaced the existing bridge in place. This was dismissed because the current location of the bridge is not in a sustainable location during high water years.
- **Relocated West Boat Dock.** Relocating the west boat dock approximately 175-200 feet south of the current location was considered to make boat queuing more efficient, better facilitate pedestrian travel in either direction, and eliminate the need for steps. The concept was dismissed because of increased impacts to the shoreline from relocation; wildlife concerns, in particular regarding bald eagles; potential user-group conflicts at the mouth of Cascade Creek between concessioner boat traffic and private fishing; difficult trail construction after the current dock was relocated; and anticipated increases in future boat dock maintenance needs, as a delta often forms at the mouth of the creek that would require dredging to allow boat access.

- **Minimum Requirement Decision Guide Alternative C: Reduced Material/construction.** Throughout the planning process, the park considered an alternative that would utilize less material and construction in the backcountry (see Appendix A), but ultimately dismissed a full analysis because the alternative did not meet the Jenny Lake Backcountry Management Goals of providing for the current level of backcountry visitors, while minimizing impacts to natural and cultural resources. This alternative also did not meet the purpose and need of the project because with limited repair, the trails would not meet current trail standards and they would continue to be unsustainable for decades. Limited trail stabilization would perpetuate the following conditions that the project identified as issues to address: user-created trails; trail drainage problems resulting in serious erosion and resource degradation; rugged trail conditions; and compacted soil and bare ground in destination areas. Future large-scale maintenance and repair projects would still need to take place if trail segments failed, resulting in a long-term and potentially greater disturbance as projects would be undertaken intermittently as needed instead of within a planned framework designed to minimize resource and visitor impacts.

  It has been determined that the estimated materials and construction considered in the preferred alternative are the minimum amount of infrastructure to support the current level of visitors without harming or degrading the resources. The park scaled down initial project design concepts and thoughtfully evaluated the amount of material required to create a sustainable trail system, keeping in mind the need to protect the American pika, a species of special concern in the State of Wyoming (See *Wildlife* section and Appendix C for additional information) present in talus slopes throughout the project area. Wildlife experts (Epps et al. 2013) recommended minimizing impacts on pika by surveying potential rock harvesting sites and limiting rock harvesting in areas occupied by pika. The park determined that no more than 30 percent of the rock utilized would come from within the project area in order to protect pika; therefore, rock had to be imported to meet the project requirements. Importing this amount of material without the use of mechanized equipment was not feasible due to the amount of time it would take to transport materials with pack stock and other alternative methods; the amount of resource damage caused by heavy pack travel on the trails for many years; the lack of workforce to accomplish the project over many years; and balancing the safety of workers and their exposure to the hazards of transportation of large rock, large quantities of gravel, and other materials without mechanized equipment for longer periods of time. For these reasons, this alternative was eliminated from detailed analysis in the EA.

Alternative Comparison Summaries

Table 3 compares the ability of the two alternatives to meet the project objectives (identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets the objectives identified for this project, while the No Action alternative does not address all of the objectives.

Table 4 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 3. Comparison of How Each Alternative Meets Project Objectives.

Project Objectives	Alternative A – No Action Meets Project Objectives?	Alternative B – Renewal Actions Meets Project Objectives?
Frontcountry		
Jenny Lake interpretive programs will provide visitors with varied experiences focusing on the major interpretive themes of the park, including education on the rich history of Jenny Lake and the recommended wilderness it provides access to. Interpretation will promote public awareness of and appreciation for wilderness character, resources, and ethics.	This objective would be somewhat met under this alternative. The Interpretive Master Plan, which is common to all alternatives, would provide guidance on interpretation of the Jenny Lake area. Therefore there would be an improvement in interpretation under this alternative although not to the extent that would occur under Alternative B because new exhibits, signs, etc., would not be designed and installed. The majority of the interpretation would remain in the undersized Jenny Lake Visitor Center.	Yes. The Interpretive Master Plan and site design propose several improvements to interpretation, including new interpretive exhibits and waysides in the frontcountry (e.g., Interpretive Plaza, Gateway Plaza, and overlooks) that would enhance interpretive opportunities. Boundary signs and interpretation of the recommended wilderness would also take place in the frontcountry to provide information about entering the wilderness.
Enhance the experience of South Jenny Lake visitors by providing an entry point with an immediate sense of arrival and clear route-finding on ABAAS compliant trails that lead them to access points for the scenic areas of Jenny Lake and the Teton Range.	No. There would continue to be several informal entrances leading to the center of the visitor services area, with no formal sense of arrival or orientation. With the confusing trail junctions, poorly designed trailheads, and user-created trails, route-finding would continue to be difficult. The confusing nature of the South Jenny Lake area would continue to result in missed opportunities and frustration, as visitors are unclear of where to see views of Jenny Lake and the Teton Range. Queuing at the boat dock would continue to be confusing and block the main trail around the lake.	Yes. Alternative B would result in improvements to circulation, route-finding, and access. Route-finding would be improved with a more intuitive, ABAAS compliant trail system, and improved directional signs leading directly to the lake. Widening some trail sections and enlarging viewing areas would alleviate congestion along trails and at viewing areas. There would be one formal entry leading to the Visitor Center Interpretive Plaza with easy access to visitor services, as well as interpretive elements. In the Gateway Plaza, critical information would be provided to visitors, and boat and hiker traffic would be separated. Queuing at the boat dock would be improved and crowding would be reduced.

Project Objectives	Alternative A – No Action Meets Project Objectives?	Alternative B – Renewal Actions Meets Project Objectives?
Restore and protect the natural and cultural resources of the Jenny Lake area by creating a more practical and intuitive trail system, rehabilitating user-created trails and other impacted areas, and protecting the integrity of historic properties.	Alternative A does not meet this objective. Confusing and redundant trails would continue to meander throughout the area, not leading directly to lakeshore overlooks. Limited designated access to lake views and the water would continue to cause user-created trails as visitors try to reach the lake. Erosion and compacted/denuded soils would continue to create undesirable trailside conditions and degradation of natural resources. Non-historic asphalt and retaining walls would continue to degrade and crumble. Jenny Lake Overlook trails would remain closed due to trail conditions and visitor safety. Although no direct, adverse effects to archeological resources would be expected because cultural resource surveys would be conducted before any repairs or maintenance are performed, historic structures would still be threatened due to the lack of fire suppression capability related to the outdated water system.	Yes and no. Major trail restoration work would result in a more direct, intuitive, sustainable trail system while maintaining the trail's historic character. Large impacted areas, as well as user-created trails, would be restored to natural conditions. However, Alternative B would result in an adverse effect to archeological resources, and therefore would do less to protect cultural resources than Alternative A. Alternative B does meet the objective by meeting firefighting flow requirements.
Improve visitor experience in the South Jenny Lake area by providing additional amenities, as well as replacing the outdated and undersized water and wastewater systems and restrooms to better accommodate the current number of visitors.	No. The developed area would continue to lack visitor amenities, such as seating, including picnic tables. The restroom would remain undersized for current use resulting in long lines. The water and wastewater systems would continue to be undersized to meet future demands for potable water, water for fighting structural fires, and sewage treatment. Bike parking would remain insufficient for the number of visitors using the multiuse pathway.	Yes. The addition of comfort elements in the frontcountry (e.g., additional seating, picnic tables, water station, shade, additional restroom facilities) would enhance the visitor experience. This alternative would also improve universal access in the frontcountry by improving existing non-compliant areas to ABAAS compliance levels. A new ABAAS compliant restroom would be constructed and a new vault toilet would be added, doubling the number of restroom facilities in South Jenny Lake. The water and wastewater systems would be upgraded to provide adequate, compliant, and safe systems. Bike parking would be reconfigured to accommodate additional bikes.

Project Objectives	Alternative A – No Action Meets Project Objectives?	Alternative B – Renewal Actions Meets Project Objectives?
Backcountry		
Offer limited interpretation that introduces visitors to wilderness and all that it represents, creating connections for visitors that foster a sense of wilderness stewardship.	No. With no boundary identification and little education and or interpretation regarding the wilderness, thousands of people a year would continue to cross into the area unaware of its wilderness status and the specific management implications associated with it.	Yes. Interpretation of the recommended wilderness would primarily take place in South Jenny Lake with limited interpretation on the west side boat dock. Wilderness boundary identification would be added; therefore, visitors would understand they were entering the recommended wilderness. Improvements to trail conditions, in combination with education and interpretation prior to their visit, would help foster a sense of connection and wilderness stewardship with this and other wilderness areas.
Improve route-finding and trail/bridge conditions, creating an easily understandable trail system to better facilitate visitor safety, circulation, and access, while maintaining the area's wilderness and historic character.	No. Due to trail design and condition, heavy snow accumulations and associated run-off, coupled with concentrated visitation, there would continue to be significant erosion and trenching. Erosion would continue to expose rocks and tree roots. Seasonally, the presence of mud would continue to cause people to walk around wet areas, creating widened tread and in some cases parallel trails. Existing trails in the Hidden Falls area would remain poorly defined and congested. This heavily used area would continue to degrade. Vegetation and topsoil would continue to erode, exposing rocks and roots. Dock configuration would remain inefficient for queuing and for visitors waiting for others.	Yes. The trail system would be improved with installation of retaining walls, causeways, water bars, new steps, and repairing gullies to improve visitor safety. The trails would be widened slightly in some areas to accommodate the number of visitors, while protecting resources. Through education, one-way, clockwise travel would be encouraged to facilitate fewer visitor encounters. The new Cascade Bridge would eliminate the need for Confusion Junction, a highly impacted area. The larger dock would provide waiting room for visitors unable to hike the trail, with space for queuing that accommodates wheel chairs and other seating. The backcountry trail work would have a mix of beneficial and adverse historic effects to the trail system, but overall the work would be in keeping with CCC style construction, and the realignment would not constitute an adverse effect under Section 106 of the NHPA.
Restore and protect the natural, cultural, and wilderness resources of the Jenny Lake area by improving trail conditions, key visitor locations, and traffic patterns, as well as revegetating undesirable user-created trails and other impacted areas.	No. The existing trail design does not meet today's park trail standards. Most impacted areas would continue to be eroded by snowmelt and heavy foot traffic. Deep gullies in the trail would remain. Creation of user-created trails, and other bare ground areas would continue and could potentially increase in number and size.	Alternative B includes many actions intended to restore and enhance Jenny Lake's natural resources. Trail removal and rehabilitation would improve natural resource conditions and help to protect them from future damage. Defining and hardening key use areas would result in less soil erosion. Improvements would encourage visitors to use viewing areas via the trail rather than traveling off trail and further degrading natural resources.

Table 4. Environmental Impact Summary by Alternative.

Impact Topic	Alternative A – No Action	Alternative B – Renewal Actions
Cultural Resources including Historic Structures, Cultural Landscapes, Ethnographic Resources, and Archeological Resources	Routine maintenance could temporarily introduce non-historic visual, audible, and atmospheric elements into the setting of the historic resources at Jenny Lake. Effects would be short-term, and of negligible intensity. Archeological resources would be preserved and protected. The risk posed by the firefighting flows that are below standards represents a long-term, minor, adverse effect on sites and districts listed in the NRHP.	Construction would temporarily introduce non-historic visual, audible, and atmospheric elements into cultural resource settings. Effects would be short-term, negligible to minor, and adverse. Long-term adverse effects would result from the potential to impact known archeological resources. There would be an adverse effect on cultural resources that are listed, or eligible for listing, in the NRHP. As a result a memorandum of agreement (MOA) will be entered into with SHPO and consulting parties, tribes, and the ACHP to mitigate adverse effects. There would be no adverse effect to the historic trail given the project entails only routine maintenance and trail rerouting.
Geologic Resources and Vegetation	Activities associated with repair of the water and wastewater systems and other routine maintenance could temporarily disturb soil and vegetation resources. Soils and vegetation may be disturbed and soil erosion may continue in off-trail areas most heavily used by visitors.	Approximately 7.67 acres of soil and vegetation would be temporarily disturbed by construction in the frontcountry and 0.92 acres would be temporarily disturbed in the backcountry. Rehabilitation would result in short-term, minor, adverse impacts. Better-defined trails would potentially reduce human use and trampling of off-trail areas, potentially reducing disturbance and erosion of soils. Trail circulation would be improved and old trails would be rehabilitated resulting in a long-term improvement to vegetation and soil conditions. BMPs and mitigation measures would be followed to control exotic invasive plant species. Mitigation measures would minimize the potential for impacts to special status plants.
Wildlife, including Special Status Species	With no changes in habitat and human use levels, use of the area by wildlife and special status species would generally remain as it is currently. There would continue to be long-term, negligible, adverse impacts on wildlife and their habitats. The primary impacts to species that have the potential to use habitat within the project area would continue to be related to high use of the area by visitors. There would be *no effect* on grizzly bear, Canada lynx, wolverine, greater sage-grouse, or yellow-billed cuckoo.	The primary effects to wildlife, including special status species, would be a temporary decline in habitat availability and quality due to construction related noise and increased presence of humans in staging and work areas. Effects would be greater in the backcountry; the use of helicopters to bring supplies into the backcountry is expected to cause short-term disturbance of wildlife that use this area. Impacts would include permanent loss of a relatively small number of trees; however, these losses would primarily occur in areas with existing high human use and low quality habitat. No population level impacts to special status species would occur under Alternative B. Alternative B *may affect but would not likely adversely affect* grizzly bear, Canada lynx, wolverine, greater sage-grouse, and yellow-billed cuckoo.

Impact Topic	Alternative A – No Action	Alternative B – Renewal Actions
Wilderness	Existing management direction would continue as it has been since the wilderness recommendation. The untrammeled quality, natural quality, and undeveloped character of wilderness would remain the same. The existing, somewhat restricted, opportunities for solitude and unconfined recreation within the project area would remain unchanged. Opportunities for solitude would continue to be limited due to high visitor numbers and non-natural sounds in the area.	There would be no effect on the untrammeled quality of the project area. Staging materials on site would adversely affect the natural character of the wilderness. Areas of soil compaction, erosion, and user-created trails would be rehabilitated, resulting in long-term, minor, beneficial impacts on the natural character of the wilderness. Transportation of materials and workers in the area, including temporary and intermittent use of helicopters and other motorized and mechanized tools, would degrade the undeveloped quality. After project completion, effects to the undeveloped quality would be long-term, moderate, and adverse. Construction activities would diminish opportunities for solitude in the short term. Encouraged one-way travel on the trails would impose new restrictions on the hiking trails in the project area, resulting in long-term, minor, adverse impacts on the primitive and unconfined recreation character of wilderness.
Natural Soundscapes	This alternative would not generate any new short-term sources of noise associated with construction. There would be no additional noise impact or changes to the current natural soundscape of the project area. Existing vehicle, equipment, and human noise would continue to contribute ambient noise to the soundscape; this would be greater in the frontcountry than in the backcountry.	This alternative would add noise in the short term; there would be no long-term increase in impacts to natural soundscapes. Project-related impacts to natural sounds would result from noise associated with the construction/rehabilitation of facilities, infrastructure, and trails. These activities would degrade the natural soundscape in affected areas and noise could affect nearby recreational users on trails, overlooks, trailheads, and other areas. It is estimated there would be approximately two weeks of helicopter flights a year, with up to 40 round-trips per day. During this time there would be moderate short-term adverse effects on soundscapes. Other construction-related activity would cause minor to moderate short-term adverse impacts to the natural soundscape. After construction there would be no additional impacts.
Visitor Experience	No substantial changes would occur to improve visitor experience, aside from routine maintenance. Access for visitors would continue to be limited, route-finding and orientation would continue to be confusing, trail conditions would largely remain in their current conditions, and interpretation would continue to be limited, although slightly improved because of the Interpretative Master Plan. Without water or wastewater system upgrades, visitor experience would potentially be affected by disruptions in service or periodic failures.	Improvements would be made to many aspects of the visitor experience in the frontcountry and backcountry, including improvements in orientation, interpretation, access, and facilities. Correcting the deficiencies of the South Jenny Lake water system would enhance visitor experience by ensuring delivery of clean potable water and ensuring adequate supplies for fire suppression needs. Short-term, localized, moderate, adverse effects would occur during construction as visitors would be affected by noise, the presence of equipment, and restricted access in certain areas. In the long term, the planned improvements would result in beneficial impacts to visitor experience.

Impact Topic	Alternative A – No Action	Alternative B – Renewal Actions
Park Operations	The No Action alternative would most likely impact future park operations due to the condition of the current water and wastewater systems. The age of these systems would result in continuously increasing maintenance. Trail conditions would continue to result in the need for emergency repairs due to drainage problems and other issues caused by poor trail conditions.	Park operations would be affected in the short term during construction. Park personnel would be required to coordinate, plan, permit, and oversee decisions associated with project design; respond to public needs and mitigations associated with project implementation; oversee construction; and in some cases, implement construction. Temporary inconveniences to park and concessioner operations would occur during construction. The replacement of the water and wastewater systems would have beneficial effects on park and concessioner operations and employee safety by providing high quality drinking water and reducing the potential for system shutdowns. Long-term, beneficial effects would result from providing dependable and adequate water delivery, allowing for a safer work environment for fire personnel responding to structural fires, and the ability of the NPS to protect life and property in case of a fire. Improved trails and facilities would be beneficial by reducing the need for maintenance and repairs.

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

Alternative B

Alternative B is the environmentally preferable alternative for several reasons: 1) The upgraded trails and facilities would ensure the sustainability of these park assets; 2) It would help protect hydrologic, soil, and vegetative resources at the site through stabilization and restoration to natural habitat of previously disturbed areas (e.g., user-created and redundant trails); 3) Trails would be improved thereby reducing the risk of injury for visitors hiking on these trails; 4) Improved trails and new and improved overlooks and viewing areas would provide aesthetically pleasing surroundings; 5) It would provide more protection and interpretation of the area's cultural resources and natural resources; 6) This alternative provides a variety of different opportunities for people of all abilities through improvements in route-finding and interpretation as well as improving ABAAS compliance; 7) By making trail circulation more intuitive, improving the trail surface, and making overlooks and viewing areas more defined, this alternative would protect resources and help to achieve a balance between population and resource use; and 9) Water system upgrades would preserve the environment for future generations; protect employee safety and welfare; improve operational efficiency and sustainability; and conserve water resources. For these reasons, Alternative B causes the least

damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources, thereby making it the environmentally preferable alternative.

Alternative A

By contrast, Alternative A (No Action) is not the environmentally preferable alternative because, although there would be no construction or ground disturbing activities that would damage previously undisturbed elements of the biological, cultural, and physical environment, this alternative would result in the following: 1) Resource deterioration would continue due to impacts in high use areas, including user-created trails; and 2) The water and wastewater systems are not sustainable with regards to energy use and water loss from breaks and leaks in the system.

Preferred Alternative

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Alternative B is the environmentally preferable alternative and better meets the project objectives; therefore, it is also considered the NPS preferred alternative. For the remainder of the document, Alternative B and the Preferred Alternative will be used interchangeably.

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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environment of the Jenny Lake project area. The focus of this chapter is on key topics that have the potential to be affected by the alternatives should they be implemented. Topics analyzed in this chapter correspond to the impact topics identified in Chapter 1 and include cultural resources; geologic resources and vegetation; wildlife, including special status species; wilderness; natural soundscapes; visitor experience; and park operations. This chapter also analyzes the environmental impacts that would result from the alternatives for the proposed project. Impact analysis discussions are organized by impact topic and then by alternative under each impact topic. The analysis of the No Action alternative provides the baseline against which the action alternative – Alternative B – is assessed. Cumulative impacts are assessed for each alternative. The discussion of cumulative impacts is followed by a conclusion statement for each resource topic.

Methods for Analyzing Impacts

The impact analysis and conclusions contained in this chapter were based on park staff knowledge of the resources and site conditions; review of existing literature and park studies; information provided by resource specialists within the NPS and other agencies; and professional judgment. In this section, the NPS takes a "hard look" at the potential direct, indirect, and cumulative effects, or impacts, for each topic carried forward. In this chapter, the potential impacts of alternatives A and B were evaluated for each retained impact topic in terms of type, context, duration, and intensity. General definitions of these criteria are defined as follows:

Type describes the classification of the impact as either direct or indirect, beneficial or adverse:

- *Direct*: An effect that is caused by an action and occurs in the same time and place.
- *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- *Beneficial*: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Context describes the area or location in which the impact would occur, such as site-specific, local, regional, or even broader. The context or extent of the impact is described as localized or widespread:

- *Local*: Impacts would be limited to a specific site or relatively small area within the park boundaries.
- *Widespread*: Impacts would occur over a large, widespread area within and/or beyond the park boundaries, or in several areas of the park.

Duration describes the length of time an effect would occur. The duration of impacts is described as short-term or long-term:

- *Short-term*: Impacts are temporary and effects are typically confined to the construction period, with the resources resuming their pre-construction conditions within approximately one year following construction.
- *Long-term*: Impacts are more permanent and would last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.

Intensity describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. The NPS equates "major" effects as "significant" effects under the terms of NEPA. The identification of "major" impacts would trigger the need for an EIS. Because definitions of intensity vary by resource topic, specific impact threshold definitions are provided separately for each impact topic analyzed in this EA.

For each impact topic, the alternatives were also evaluated for their contribution to cumulative impacts, consistent with the CEQ (1986) regulations for implementing NEPA. Cumulative effects are "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."

Impacts have been assessed assuming that mitigation measures (described in Chapter 2) would be implemented to minimize or avoid impacts. If mitigation measures described were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

Cultural Resources

Affected Environment

The Jenny Lake area contains a variety of cultural resources, ranging from archeological sites to cultural landscape features, that are eligible for listing in the NRHP. For listing in the NRHP, cultural resources must meet one or more of the following criteria of significance (NPS 1997):

- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B: Associated with the lives of persons significant in our past;
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history.

Historic Structures and Cultural Landscapes

For the purposes of cultural resource management, historic structures and cultural landscapes are not treated as resources independent of each other. Instead historic structures and cultural landscape features are seen as components of a larger entity such as a historic site or district when such sites or districts are considered eligible for listing in the NRHP.

A prehistoric or historic structure is a constructed work, consciously created to serve human activity. Examples of these structures include buildings and monuments, dams, millraces and canals, stockades and fences, temple mounds and kivas, ruins of all structural types, and outdoor sculptures. Grand Teton National Park includes 542 individual National Register-eligible historic

structures found in 45 locations throughout the park. Many of these historic districts consist of multiple buildings, structures, landscape features, and other associated elements. The park also includes documented cultural landscapes.

The NPS defines a cultural landscape as "… a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built." According to NPS-28: *Cultural Resource Management Guidelines* (2002), cultural landscapes are…. settings people have created in the natural world. They reveal fundamental ties between people and the land, ties based on our need to grow food, give form to our settlements, meet requirements for recreation, and find suitable places to bury our dead. Landscapes are intertwined patterns of things both natural and constructed: plants and fences, watercourses and buildings. They range from formal gardens to cattle ranches, from cemeteries and pilgrimage routes to village squares. They are special places: expressions of human manipulation and adaptation of the land.

A cultural landscape encompasses a diversity of places, many with important land use history or other cultural values. Cultural landscapes include national battlefields; homes and designed estate grounds of dignitaries, inventors, and writers; sites held sacred by native peoples from prehistoric times to present; and valleys where our ancestors settled and farmed. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions (NPS 1998). Cultural landscapes have often maintained a continuity of land use into the present.

The landscape must also have integrity of those patterns and features necessary to convey its significance. These include spatial organization and land forms; topography; vegetation; circulation networks; water features; and structures/buildings, site furnishings, or objects (Secretary of the Interior 1995).

All of the buildings older than 50 years old within the Jenny Lake developed area have been evaluated for National Register eligibility. The developed area contains three historic districts: the Jenny Lake Ranger Station Historic District (1990), Jenny Lake Boat Concession Facilities (1998), and Jenny Lake CCC Camp #NP-4 (1998). The area has not been evaluated as a cultural landscape; however, because the historic buildings were moved to their current location from the southeast shore of Jenny Lake in the early 1990s, the area will not be evaluated as a cultural landscape until the new configuration is closer to fifty years old.

Jenny Lake's historic significance lies in its role as an early center of outdoor recreation activity in Jackson Hole. Redevelopment of the Jenny Lake area occurred in the late 1970s and again in the 1990s (NPS 1977; NPS 1990a); most of the historic resources that remain at Jenny Lake reflect the area's traditional importance as a scenic attraction and recreation center in the park.

Ethnographic Resources

Ethnographic resources are defined by the NPS as any "…site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system or group traditionally associated with it" (NPS 1998). This includes subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. Sacred sites, a type of ethnographic resource, are defined as any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, sacred by virtue of its established

religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site (EO 13007, Indian Sacred Sites, May 24, 1996).

Jenny Lake has been managed as a distinct area within Grand Teton National Park since the 1950s; however, native occupants do not view this place or even the region as "separated along management borders but as a greater whole that includes Grand Teton, the National Elk Refuge, and Yellowstone National Park, and the surrounding area" (Walker and Graves 2007). Resources used by the various aboriginal groups present in the Jenny Lake area were not categorized, but rather were viewed holistically. Locales were used for a multitude of purposes and natural resources were not separated from cultural resources. Cultural sites were occupied places with an abundance of natural resources used for both physical and spiritual survival. Places combining a blending of undifferentiated natural and cultural resources were intimately tied to tribal spirituality. Ties between cultural life and geological zones were held sacred (Walker and Graves 2007). These areas are part of a broad cultural landscape still held sacred by Native Americans (Rhodd 2012, in Mettler and Associates, Inc. 2012).

The region surrounding Jenny Lake has been continuously used for its cultural and natural resources since traditional times dating well back into prehistory. Because of the long use and occupancy of the region, the area is filled with tribally significant sites known only to tribal elders, including battle sites, ceremonial grounds, mythic sites, sweat bath sites, teaching sites, and others (Walker and Graves 2007). Because of the many monumental geographic features in the region and the striking scenery, the Teton Range is regarded as a sacred place that is valued by several different tribes. The region continues to be a traditional multi-tribal and multiuse area that is important to a number of contemporary tribes. Grand Teton National Park holds many resources important to these tribes, including minerals; water; wildlife such as bison, elk, and pronghorn; and plants such as sagebrush and native grasses. These resources do not always have defined boundaries and may occur in and adjacent to the project area. Tribal hunting, gathering of flora and mineral resources, ceremonial practices, memorializing buried ancestors, retracing trails, vision quests, teaching of traditional culture and history, and other uses continue to occur in the region.

Ethnographic resources, including sacred sites, have not been specifically identified within the project area but may be identified in the future. During the planning process for this EA, the park contacted traditionally associated tribes via a scoping newsletter regarding the proposed action in August 2012, but did not receive any comments. Additional consultation occurred throughout the EA development process and each traditionally associated American Indian tribe will be made aware of the availability of this EA for review and comment during the public review period. The NPS will continue to consult with the tribes about potential concerns associated with ethnographic resources. If traditionally associated American Indian tribes identify ethnographic resources, including sacred sites, in the project area, the NPS will further consult with them to avoid or mitigate adverse impacts. Appropriate mitigation measures would be undertaken in consultation with the tribes. The NPS would also accommodate, to the extent practicable, access to and ceremonial use of sacred sites by American Indian religious practitioners. The location of ethnographic sites would not be made public. In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during project implementation and are determined to be of American Indian origin, provisions outlined in the Native American Graves Protection and Repatriation Act would be followed.

Archeological Resources

Archeological resources are the remains of past human life or activity. Archeological resources may be, but are not limited to, stratified layers of household debris, weathered pages of a field notebook, pollen samples, pottery, stone tools, and historic trash. Archeological resources can be found above ground or buried; the soils within the park keep many artifacts on the surface. Archeological resources are commonly associated with prehistoric peoples, but may also be products of a contemporary society. These resources are nonrenewable and irreplaceable. Thus, it is important that all management decisions and activities throughout the National Park System do no harm or otherwise adversely impact the integrity of the resources.

The NPS has an ongoing archeological program to determine the extent of prehistoric and historic activity within the boundaries of all NPS parks. In Grand Teton National Park, a number of surveys have been performed for projects in the Jenny Lake area. The most recent survey occurred in 2012 when an archeological contracting firm performed a Wyoming SHPO file search, Grand Teton National Park file search, a review of applicable site forms and maps, General Land Office records, literature, and archeological and historical resources within the specific and surrounding area, as well as a site inventory for the West Jenny Lake Trail/East Cascade Canyon Trail and its associated elements, which is part of the current project area. Together these surveys indicate that the Jenny Lake area and surroundings are rich in prehistoric and historic archeological sites.

Cultural Resources Listed in or Eligible for the National Register of Historic Places

The Jenny Lake area contains four historic districts that are listed in the NRHP and four archeological sites that are considered eligible for listing in the National Register. The Jenny Lake Ranger Station Historic District was determined eligible for listing in the National Register in 1990, and the Jenny Lake Boat Concession Facilities and Jenny Lake CCC Camp NP-4 were determined eligible for listing in the National Register in 1998 (http://nrhp.focus.nps.gov/). Information about these districts as well as additional resources that are eligible for listing is presented in this section.

Historic Structures

The **Jenny Lake Ranger Station Historic District** on the south shore of Jenny Lake was listed in the NRHP in 1990. This historic district is significant under Criterion C of the National Register because it is a clear statement of the local interpretation of the NPS' rustic architecture building philosophy of the 1930s at Grand Teton National Park. The district is significant because it contains examples of three types of rustic architecture, all from the 1930s, that represent many other buildings both extant and now removed in the park. The Jenny Lake Ranger Station Historic District was evaluated under the Rustic Architecture context, and four buildings were considered contributing. A contributing resource must reflect the significance and integrity of a district as a whole. If the resource does not reflect significance or integrity, it is considered non-contributing. The Jenny Lake Ranger Station Historic District buildings were built from standardized plans (comfort stations) and local adaptations of NPS plans in the rebuilding of the ranger station and studio more than 50 years ago. When these buildings were built or rebuilt (studio and ranger station), the architectural philosophy of the NPS was to construct in harmony with the surrounding environment. The district contains the only clearly dateable examples of the local rebuilding of acquired structures into ones that fit park needs and design standards that were rebuilt more than 50 years ago.

The Grand Teton National Park Master Plan recognized the significance of Jenny Lake as a major visitor service area within the park (Caywood et al. 1997a). In addition to the Jenny Lake Ranger Station, the district also includes the Crandall Cabin (studio) and two comfort stations. The studio and ranger station were made from other buildings, located elsewhere in the park. They were disassembled and then rebuilt at a location nearby (the southeast shore of Jenny Lake) in 1930 (ranger station) and 1931 (studio) following at least the guidelines, if not actual plans, drawn up by NPS designers. The ranger station was originally Lee Manges' homestead cabin and was transported to the south shore of Jenny Lake and rebuilt to plans approved by the NPS (NPS 2013c; Mehls 1988). It served as a heavily-used visitor center until the 1960s (Mehls 1988), and remains a functioning ranger station today. The current Jenny Lake Visitor Center, the former Crandall Studio, was first constructed by Harrison Crandall for use as a studio in 1925-1926 along the North Jenny Road. When the Park Service purchased his property in 1931 he remained in the park as a concessioner and, with the help of the NPS, he rebuilt his cabin at a former location on the southeast shore of Jenny Lake. He remained in his studio until his contract was purchased in 1958 (Mehls 1988). The Crandall cabin has served many functions, including a dancehall, photography studio, and a general store, and it is now the Jenny Lake Visitor Center (NPS 2013c). The cabin, along with the other three contributing buildings in the Jenny Lake Ranger Station district, was moved to its current location in 1992 (following listing in the NRHP). Two comfort stations associated with the nearby campground were constructed nearby by the CCC (Mehls 1988).

The **Jenny Lake Boat Concession Facilities** consists of Reimer's cabin, a boathouse, a boat dock, two employee cabins, and a footbridge. The Jenny Lake Boat Concession Facilities are significant under Criterion A of the National Register for its association with the development of Jenny Lake as the first concession area in Grand Teton National Park, and under Criterion C for its association with NPS rustic architecture. Reimer's cabin and the associated boathouse (classified as a "building") meet the registration requirements established for the Concessioner Complex property types, Grand Teton National Park Multiple Property Submission. The modern boat dock, two employee cabins, and footbridge moved to the site during the modern period are noncontributing buildings/structures. Locals refer to the boathouse – which was built in 1932 according to Park Service records – as the Wort boathouse, after the first concessioner Charles Wort, who had a boat concession even before Grand Teton National Park was created. Wort maintained the concession until 1935 when Robert (Dick) Reimer assumed the boat concession license. The design for Reimer's cabin was approved by the park and construction was completed in 1937. The Landscape Division of the Park Service approved the preliminary drawings and supervised its construction.

The **Jenny Lake CCC Camp (N.P. Camp 4)** was constructed in 1935 and consisted of a mess hall and associated bathhouse. Upon termination of the CCC program, most camp living facilities were moved, dismantled, or salvaged; while remnants of the camps remain throughout the National Park System, intact camps and camp buildings, through which the living conditions of CCC crews can be discerned and interpreted, are extremely rare. Due to the rarity and because of the social significance of the New Deal and the CCC in American social and political history, and despite post-historic modifications to the building's windows and doors, the remaining Jenny Lake CCC Camp buildings (mess hall and associated bathhouse) are significant under Criterion A (Park Administration and Development) of the National Register. In accordance with National Register guidelines, the mess hall and associated bathhouse are classified as a "building" rather than a "district." From the 1950s until 1993 the mess hall was used as a dormitory for the saddle-

horse concession operated by Lowell Rudd (Caywood et al. 1997b). The bathhouse was used as office space and living quarters for the Petzoldt-Exum School of American Mountaineering beginning in 1946. That company, now known as the Exum Mountain Guides – a park climbing concessioner, is still there (NPS 2013d) and the bathhouse is used as a facility for storage, administrative use, and registration.

The **Jenny Lake Campground** is historically significant as the first campground in Grand Teton National Park for its association with recreation, the rustic style, New Deal era landscape architecture, and the CCC. The period of significance extends from 1926 when the campground was first established until 1982 when the southern campground loop road was closed.

Archeological Resources

In addition to historic districts, there are several prehistoric and historic archeological sites in the Jenny/String Lake area that are eligible for listing on the NRHP. The results of the file search, review of relevant site forms, surveys, and projects conducted within and around the area, and examination of the General Land Office records and maps, as well as knowledge of the area suggest a moderate site density, especially around the water and in other alluvial areas.

Numerous sites have been located within the Jenny Lake area, forming "part of a series of hunter-gatherer camps running from Leigh Lake down Cottonwood Creek" (Connor 1992). The south end of Jenny Lake within the project area contains many prehistoric sites, including four National Register eligible sites: 48TE411, 48TE412, 48TE414, and 48TE576. A Scottsbluff point and other Paleo-Indian style projectile points have been discovered at site 48TE411. Site 48TE414 has yielded a range of projectile point styles indicating occupation from the Middle Archaic to the Late Prehistoric Period (Connor 1992). Items found at site 48TE414 include several lanceolate, corner-notched, and serrated type points as well as scrapers, perforators, knives, and flakes. Site 48TE576 represents a small camp site, likely a Shoshone male hunting camp, about 60 square feet in size of which half was disturbed by tree removal after a November 1973 wind storm. The site contained multiple complete triangular side-notched and basal notched points, tools, fire cracked rock from at least three hearths, and obsidian flakes. This site is likely a single component site, a single occupation for a short period of time (Wright 1976). Site 48TE412, is located near the outlet of String Lake, within the project area. This site consists of prehistoric artifacts dating to the Late Archaic or early Late Prehistoric. The important tool classes – utilized flakes, perforators, and points – along with the evidence of extensive tool manufacture may indicate that activities were directed toward the preparation of hunting tools. These sites are important because they provide information significant to the prehistory of the area.

In 1995, Wyoming State Historic Preservation Officer John Keck observed that, "it appears that the Civilian Conservation Corp (CCC) played a prominent role in the development of the Park's trail network" (Keck 1995). Correspondence between the SHPO and the NPS indicated that the Jenny Lake Trail and the Cascade Canyon Trail were "determined to be a contributing component of the Valley Trail system" (Keck 1995). It was stated that in 1995 several Jenny Lake features retained sufficient integrity to be considered contributing components of the Valley Trail system and be eligible for inclusion on the National Register (Keck 1995). In 2012 Mettler and Associates, Inc. conducted a Class III Cultural Resource Inventory of portions of the West Jenny Lake Trail and portions of the East Cascade Canyon Trail for the Jenny Lake Trail Renewal Project (Mettler and Associates, Inc. 2012). Findings from that inventory reported that

with the exception of periodic maintenance and replacement of some bridges, the Jenny Lake/Cascade Canyon Trail System is one of the oldest in the park.

Site 48TE1862 consists of the West Jenny Lake Trail/East Cascade Canyon Trail and its associated elements (Mettler and Associates, Inc. 2012). The linear site includes 48 elements, including stone steps, wooden bridges, wooden stairs, walkways, culverts, rock retaining walls, part of a horse trail, a boat dock and platform, and paths leading to climbing areas. Only five of the elements are considered contributing elements and date to the period of significance. The linear site is recommended for inclusion in the National Register under Criterion A and C, with five contributing elements. The trail and five contributing elements are significant under the contexts of Park Administration and Development, 1929-1950 and Dude Ranching and Tourism, 1908-1948. The trail is recommended as eligible for the National Register under Criteria A due to its association with the early transportation system of the Park and the effects this system has had upon tourism and development within the Park. The Jenny Lake/East Cascade Trail facilitated recreation and highlighted the natural beauty and spectacular vistas of the area promoting popularity among park visitors. Under Criteria C, the trail and five elements are recommended as Eligible for the National Register as expressions of standards formulated for trail construction within the CCC standards and the larger framework of rustic architecture demonstrating naturalistic design that largely governed development in national parks prior to World War II. The West Jenny Lake/East Cascade Trail reflects rustic architecture principles through its association with trail standards and architectural styles developed in 1918 for national parks (Mettler and Associates, Inc. 2012).

Environmental Consequences

Impact Analysis Methods

In this EA, impacts on cultural resources are described in terms of type, context, duration, and intensity, consistent with the CEQ regulations for implementing NEPA. In addition the impact analysis is intended to comply with the requirements of Section 106 of the NHPA. In accordance with ACHP regulations implementing Section 106 of the NHPA (36 CFR 10 section 800), "Protection of Historic Properties," impacts on cultural resources are identified and evaluated by:

- Determining the area of potential effects;
- Identifying cultural resources present in the area of potential effects that are listed in or eligible to be listed in the NRHP;
- Applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and
- Considering ways to avoid, minimize, or mitigate adverse effects.

Under the section 106 regulations, a determination of either adverse effect or no adverse effect must be made for affected National Register-listed or -eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for listing in the National Register (e.g., diminishing the integrity of the location, design, setting, materials, workmanship, feeling, or association of the resource). Adverse effects also include reasonably foreseeable effects caused by an action that would occur later in time, be farther removed in distance or be cumulative (36 CFR section 800.5, "Assessment of Adverse Effects"). A no adverse effect determination means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for listing in the National Register.

For purposes of analyzing impacts on archeological sites and historic structures/buildings that are listed in or eligible to be listed in the National Register, the thresholds of change for intensity of an impact are defined below. The mitigation measures in Chapter 2 would be implemented as part of the project and were considered in the analysis for the action alternative. The CEQ regulations (1978) and NPS DO 12: Conservation Planning, Environmental Impact Analysis and Decision-making guidelines (NPS 2001) for implementing NEPA call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, such as reducing the intensity of an impact from major to moderate or minor. However, any resulting reduction in impact intensity applies only to the NEPA analysis. It does not suggest that the level of effect as defined by section 106 would be similarly reduced. Although adverse effects under section 106 may be mitigated, any effect that was not totally avoided would remain adverse. A section 106 summary is included in the impact analysis for the preferred alternative. This summary is intended to meet the requirements of section 106 and is an assessment of the effect of the undertaking (implementation of the preferred alternative) on cultural resources, based on the criteria of effect and adverse effect found in the ACHP regulations.

Threshold	Definition
Negligible	Disturbance of a cultural resource or impacts on character-defining features, elements, or patterns of structures and landscapes would be barely perceptible and not measurable. For purposes of section 106, the determination would be no adverse effect.
Minor	The impact on cultural resources is measurable or perceptible, but it is slight and affects a limited area of a site or group of sites. The impact does not affect the character-defining features of a NRHP eligible or listed archeological site and would not have a permanent effect on the integrity of any archeological sites. Impacts on character-defining features, elements, or patterns of structures and landscapes would be perceptible or measurable, but would be slight and localized, resulting in little, if any, loss of integrity. For purposes of section 106, the determination would be no adverse effect.
Moderate	Disturbance of a cultural resource results in loss of integrity. The determination of effect for §106 would be *adverse effect*. An MOA is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the ACHP in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.
Major	Disturbance of a cultural resource results in loss of integrity. The determination of effect for §106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or ACHP are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
Short-term	Impacts would be limited to those that temporarily introduced non-historic visual, audible, or atmospheric elements lasting only as long as construction into the setting of the cultural resources.
Long-term	Impacts would be those lasting beyond the construction period.

Area of Potential Effects

The Area of Potential Effects (APE) is twofold. First, impacts on cultural resources were considered for all parts of the project area that could be disturbed by project implementation, such as ground disturbance. Second, visual and audible impacts to cultural resources were considered (See APE figures in Appendix B).

The APE contains four historic districts: Jenny Lake Ranger Station, Jenny Lake Boat Concession Facilities, Jenny Lake CCC Camp #NP4, and the Jenny Lake Campground as well as

four archeological sites. The majority of the ground disturbance APE has been surveyed for archeological resources and all of the buildings 40 years or older have been evaluated for National Register eligibility. A few segments of the ground disturbance APE have not been surveyed, however, the park will complete all surveys and section 106 consultation prior to project initiation and there is a low likelihood of identifying artifacts in these areas. Not all of the visual and audible APE has been surveyed. However, consistent with 36 CFR 800.4 b(1), the level of identification is appropriate given the type and magnitude of impacts anticipated in the visual and audible APE.

Alternative A (No Action Alternative)

Impact Analysis

Under Alternative A, routine maintenance of trails and facilities would continue as funds are available, but overall upgrades and redesign to the trails and facilities in the Jenny Lake area would not occur. These maintenance activities would be in previously disturbed locations. Continued routine maintenance of the water and wastewater systems would occur, with repairs as needed, but neither system would be replaced. Repairs to these existing system components would require excavations to patch or replace failed components, but such activities would occur in ground that was disturbed when the features were installed. Construction activities associated with repair of the water and wastewater systems and other routine maintenance could temporarily introduce non-historic visual, audible, and atmospheric elements into the setting of the historic resources at Jenny Lake. Such intrusions, however, would be short-term, lasting only as long as construction, and of negligible intensity. The effects would be short term, direct, localized, negligible, and adverse. Cultural resource surveys would be conducted before any work is performed and any repairs would be completed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Any archeological resources that may be present in the area would be preserved and protected in situ under this alternative.

As described in Chapter 1, the existing system is non-compliant with structural fire suppression requirements set by the National Fire Protection Authority 1194 and 1142 both in terms of capacity and size of connected water service line. Per DO 58, Structural Fire Management, "NPS structural fire program will protect from damage or loss, to the greatest extent possible, cultural resources, including historic and prehistoric structures, museum and archival collections…" Under this alternative the water system would continue to be undersized to meet future demands for water for fighting structural fires and the DO would not be met. This puts the historic structures in the area at risk. At any of these sites, a severe structural fire that could not be controlled because of inadequate water supplies would diminish the integrity of the resource, potentially to the extent that it was no longer eligible for listing. Therefore, the risk posed by firefighting flows that are below standards represents a long-term, indirect, localized, minor, adverse effect on sites and districts listed in the National Register.

Cumulative Impacts

Past development of park facilities has affected cultural resources. Projects with the potential to impact cultural resources in the vicinity of Jenny Lake include road construction and construction of the multi-use pathway system from the town of Jackson to South Jenny Lake; the SW Trail maintenance project; replacement of the West Cascade, String Lake, and Exum Bridges; and rehabilitation of the Moose water and wastewater system. For the most part, the actions in the cumulative impact scenario avoided or would avoid cultural resources. Continued consultation with associated tribal groups and the Wyoming SHPO on future projects would help

to ensure that any adverse effects of future projects on cultural resources would be negligible to minor. Therefore, the cumulative impact on archeological resources from other actions would be short-term, direct, localized, negligible to minor, and adverse. Implementation of Alternative A would result in negligible to moderate impacts on cultural resources. The impacts of this alternative, in combination with the adverse impacts on cultural resources from other past, present, and reasonably foreseeable future actions, would result in a minor, adverse cumulative impact. The effects of Alternative A would contribute minimally to the adverse cumulative impact on cultural resources.

Alternative B (NPS Preferred Alternative)

Impact Analysis - Frontcountry

Overall, construction activities in the frontcountry associated with the proposed action would temporarily introduce non-historic visual, audible, and atmospheric elements into cultural resource settings. Such intrusions would be short-term, lasting only as long as construction occurred and would result in negligible or minor, adverse impacts. In addition, long-term adverse effects would result because of the potential to impact known archeological resources. Effects would be short- and long-term, direct, localized, negligible to moderate, and adverse, and long-term, direct, localized, negligible to minor, and beneficial.

Construction activities related to improvements to trail circulation, the Boat House Overlook, water and wastewater systems, Cottonwood Creek Beach, and the String Lake Outlet area would result in long-term, direct, localized, moderate, adverse effects and would constitute an adverse effect under section 106. As a result, an MOA will be entered into with SHPO and consulting parties, tribes, and the ACHP to mitigate these adverse effects.

Construction at the Jenny Lake Visitor Center would have a negligible to minor beneficial impact on the Jenny Lake Ranger Station Historic District. Because the Jenny Lake Visitor (aka Crandall Studio) was moved to its current location, the integrity of the structure rests on its material, association, craftsmanship, and design rather than feeling, location, and setting. Therefore, the proposed improvements would have no impact to the characteristics of the property that qualify the property for inclusion in the National Register.

Construction in the Gateway Plaza would have a minor beneficial impact on cultural resources as it involves the relocation of the Moose Entrance Kiosk. The entrance kiosk was listed in the NRHP in 1990 in a non-original location. The park received SHPO concurrence in 2000 to move the kiosk to Jenny Lake; however, the plan was never executed. This action will be beneficial to the resource as it will put it in a context that more closely resembles the original context (in contact with visitors). In its current location, it is not viewed or visited by the public, just seen while driving past. While the Gateway Bridge and East Boat Dock are associated with the Jenny Lake boat concession facilities, they are later in age and are non-contributing elements of the site.

The use of CCC style construction designs at lake overlooks and access points would be in keeping with the character of the area. The construction of an ABAAS-compliant restroom in the eastern section of the campground would have a minor, adverse, local, long-term effect on the historic district. The new facility would be designed in keeping with the historic character of the district and would not affect the overall integrity of the cultural landscape.

Construction of the Boat House Beach would have no impact on the Jenny Lake boat concession facilities. The proposed surface trail and stone steps and erosion checks would not alter the

characteristics of the property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Construction in the Reimer's Cabin area would have no impact to Reimer's Cabin (which is part of the Jenny Lake boat concession facilities). It would have a negligible impact to the integrity of the setting of the boat concession facilities.

Construction in the Southwest Trail area (delineating trail edges, revegetating user created trails, creating resting areas, addressing erosion, and relocating a short section of trail approaching the boat launch) would have a negligible impact on the integrity of the setting of the Jenny Lake Boat Concession Facilities. It would have no impact to a minor beneficial impact on the historic trail system. The use of CCC style construction designs would be in keeping with the character of the trail system as designed and constructed by the CCC.

Construction activities in the String Lake Outlet area would have a moderate adverse impact on Site 48TE412, a NRHP-eligible archeological site. The site has been previously impacted by construction but the contributing portions of the site maintain their physical integrity, and therefore the site is still eligible for inclusion in the NRHP.

Construction in the Cottonwood Creek Beach area would have a moderate adverse impact on Site 48TE414, a NRHP-eligible archeological site. Construction to improve trail circulation would also have a moderate adverse impact on Site 48TE414. The site has been previously impacted by construction but the contributing portions of the site maintain their physical integrity, and therefore the site is still eligible for inclusion in the NRHP.

Construction in the Boat House Overlook segment could have a moderate adverse impact on Site 48TE411, a NRHP-eligible archeological site. The site has been previously impacted by construction and maintenance activities but the contributing portions of the site maintain their physical integrity, and therefore the site is still eligible for inclusion in the NRHP. The removal of the propane tank would have a minor beneficial impact to the integrity of the setting of the boat house.

Construction to replace the water and wastewater systems would disturb Site 48TE414. This would result in long-term, direct, localized, moderate, adverse effects to cultural resources.

Alternative B would reliably deliver firefighting flows that met all NPS and National Fire Protection Association requirements for volume, duration, and pressure. This would reduce (but not eliminate) the potential for severe structural fires that could diminish the integrity of cultural resources in the Jenny Lake area. The improved firefighting ability would result in long-term, moderate, beneficial effects on cultural resources.

Removal of the existing vault toilet from the NPS Jenny Lake CCC Camp NP-4 Historic District would result in long-term, direct, minor, beneficial impacts to cultural resources. The vault toilet would be relocated to an area immediately south of the historic district and out of the viewshed.

Impact Analysis – Backcountry

Overall, construction activities associated with the Preferred Alternative in the backcountry project area would temporarily introduce non-historic visual, audible, and atmospheric elements into cultural resource settings. Such intrusions would be short-term, lasting only as long as construction occurred and would result in negligible or minor, adverse impacts with the exceptions of the bridge replacement over Cascade Creek and the rerouting of Confusion

Junction and the work to repair the large gullies on the way to Inspiration Point. There would be no adverse effect to the historic trail given the project entails routine maintenance and trail rerouting (Mettler and Associates, Inc. 2012). Effects would be short-term, direct, localized, negligible to minor, and adverse, and long-term, direct, localized, negligible to minor, and beneficial.

The Preferred Alternative in the backcountry involves potential ground disturbing activities including maintenance of existing trails and potentially rerouting portions of the trail. In 1987, a Programmatic Agreement was negotiated and signed between the Wyoming SHPO and Grand Teton National Park "to establish a program with section 106 of the NHPA and set forth a streamlined process when agreed criteria are met and procedures followed" (U.S. Department of the Interior 1987). In reference to trails, the agreement "pertains only to maintenance activities undertaken on existing man-made trails within park boundaries" (U.S. Department of the Interior 1987). Maintenance activities include work specifically outlined in the Trail Standard Guide: Grand Teton National Park and John D. Rockefeller, Jr. Memorial Parkway, Wyoming National Park. Specifications for each type of trail maintenance activity and trail rerouting specifications are provided (NPS 1991). Provided all the necessary guidelines are followed per the above mentioned documents, this undertaking would have no adverse effect to eligible site 48TE1862 given the project entails routine maintenance and trail rerouting (Mettler and Associates, Inc. 2012).

Construction in the West Boat Dock area would have no impact to a minor beneficial impact on the historic trail system. The West Boat Dock was determined to be a non-contributing element to site 48TE1862. The use of CCC style construction designs would be in keeping with the character of the trail system as designed and constructed by the CCC.

Construction to replace several exposed mortar steps that are failing would have no impact to a minor beneficial impact on the historic trail system as the stairs were determined non-contributing elements to site 48TE1862. The use of CCC style construction designs would be in keeping with the character of the trail system as designed and constructed by the CCC. A safer and more historically accurate trail segment would be created by replacing these structures.

Construction of a relocated Cascade Creek Bridge and rerouting of Confusion Junction would have a moderate adverse impact on the historic trail system because of the obliteration of a segment of historic trail alignment and the addition of a new spur trail to the north. However, because the realignment constitutes only a small fraction of the overall trail alignment and because the new trail segment would be in keeping with CCC style construction, the realignment would not constitute an adverse effect under section 106 of the NHPA.

Construction at the Hitching Post, on the Lower Inspiration Point Trail, at Rendezvous Point, at Inspiration Point, on the Lower Cascade Canyon Trail, on the North Side Cascade Creek, and where the timber steps would be replaced on the south side of Cascade Creek near the West Cascade Bridge would all have minor beneficial impacts on the historic trail system. The use of CCC style construction designs would be in character of the trail system as designed and constructed by the CCC. Construction on the Upper Inspiration Point Trail would have a moderate beneficial impact to the CCC retaining wall by stabilizing the wall with CCC-style construction designs.

Construction to repair gullies on the trail in the backcountry would have a minor beneficial impact on the historic trail system as it would protect the resource without detracting from the

character defining features of the trail. The use of CCC style construction designs would be in character with the trail system as designed and constructed by the CCC.

Construction on the South Side Cascade Creek to address runoff erosion with the addition of new and improved trail structures would have a minor to moderate beneficial impact on a segment of a contributing element of the NRHP eligible historic trail. The use of CCC style construction designs would be in character with the trail system as designed and constructed by the CCC.

Construction to repair the gullies midway up the Inspiration Point trail would have a moderate adverse impact on a contributing segment of a NRHP-eligible trail. The large quantities of stone and fill necessary would result in some loss of integrity but construction but would not jeopardize the eligibility of the trail segment.

Construction upgrades to the approach of the West Cascade Bridge would have a minor adverse impact to a segment of an NRHP-eligible trail.

Construction on the Hidden Falls Overlook would have a minor beneficial impact on the historic trail system. Construction of a new spur trail would have no impact on the existing trail. The removal of the buck and rail fences would have a minor beneficial impact to the integrity of setting for the trail system. The use of CCC style construction designs would be in character with the trail system as designed and constructed by the CCC.

Construction on the Hidden Falls Bridges would have a minor beneficial impact on the historic trail system. The current bridges are non-contributing features and are temporary, with a short lifespan of five to 10 years. The use of CCC style construction designs would be in character with the trail system as designed and constructed by the CCC.

Cumulative Impacts

Past development of park facilities has affected cultural resources. Actions with the potential to impact cultural resources in the vicinity of Jenny Lake are the same as those described for the No Action alternative. For the most part, the actions in the cumulative impact scenario would avoid cultural resources. Continued consultation with associated tribal groups and the Wyoming SHPO on future projects would help to ensure that any adverse effects of future projects on cultural resources would be negligible to minor. Therefore, the cumulative impact on cultural resources from other actions would be negligible to minor, short-term, and adverse. Implementation of Alternative B would result in negligible to moderate impacts on cultural resources. The impacts of this alternative, in combination with the adverse impacts on cultural resources from other past, present, and reasonably foreseeable future actions, would result in a moderate adverse cumulative impact. The effects of Alternative B would contribute moderately to the adverse cumulative impact on cultural resources.

Section 106 Summary

After applying the criteria of the ACHP for adverse effects (36 CFR section 800.5, Assessment of Adverse Effects), the NPS concludes that implementation of the Preferred Alternative would have an adverse effect on the cultural resources in and near Grand Teton National Park that are listed, or eligible for listing, in the NRHP. Construction activities related to improvements to trail circulation, the Boat House Overlook, water and wastewater systems, Cottonwood Creek Beach, and the String Lake Outlet area would result in long-term, direct, localized, moderate, adverse effects and would constitute an adverse effect under section 106. As a result an MOA will be entered into with SHPO and consulting parties, tribes, and the ACHP to mitigate these adverse effects.

Geologic Resources and Vegetation, Including Special Status Plant Species

Affected Environment

Geologic Resources (Topography, Geology, and Soils)

Section 4.8 of the *NPS Management Policies 2006* addresses geologic resource management including geologic features. The term "geologic features" describes the products and physical components of geologic processes. Examples of geologic features in parks include rocks, soils, and minerals; canyons and arches in erosional landscapes; and dramatic or unusual rock outcrops and formations. For the purpose of this discussion, topography, geology, and soils have been included under this topic. The *NPS Management Policies 2006* states that NPS will actively seek to understand and preserve the soil resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources. Section 4.8.2.4, Soil Resources Management, states "…Management action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils. Soil conservation and soil amendment practices may be implemented to reduce impacts. Importation of off-site soil or soil amendments may be used to restore damaged sites…"

Topography and Geology

One of the purposes of Grand Teton National Park is to "protect a unique geologic landscape…." The Teton Range is one of the continent's youngest mountain ranges, yet exposes some of the oldest rocks on earth. This fault block mountain range abruptly rises up nearly 7,000 feet above the valley floor. At the foot of the mountains are several glacial lakes. Beyond the glacial lakes is a broad valley floor, situated at approximately 6,800 feet elevation that is comprised of high elevation sagebrush plant communities.

The surficial geology of the area is composed of a highly porous and permeable glacial outwash. Sands, gravels, and talus of various grain sizes constitute the outwash deposits. Several cycles of climatic cooling followed by warming during the past two million years resulted in the advance and retreat of alpine glaciers in the Teton Range. Modern glaciers in the park reformed within the last 5,000 years, during what is known as the Little Ice Age. Glaciers in the Teton Range advanced down glacial troughs and spilled onto the floor of Jackson Hole. Poorly sorted and unstratified material was deposited as till at the margins of the ice during retreat of the glaciers. The till accumulated in ridges as moraines. Evergreen forests grow on the till of the moraines because the unsorted sediment is less permeable and can support a relatively high water table. Outwash is very porous and permeable because there is no fine-grained sediment to fill the pore spaces. In these areas, sagebrush is more prevalent because it has a long tap root that can reach the deeper water table (Mettler and Associates 2012).

Drainage in the Teton Range is often impounded behind these moraines, forming many lakes, one of which is Jenny Lake. Jenny Lake is situated in an area that is bounded to the west by the sheer slopes of the highest peaks in the Teton Mountain Range. The lake and its forested ring of morainal debris were formed after the retreat of the Pinedale glaciation.

The frontcountry portion of the project area (non-wilderness as defined in Chapter 1) is relatively flat with some gradual slopes along the trails to the west side of the lake as well as slopes leading down to the lake. In contrast, the backcountry (wilderness) is comprised of steep slopes within a heavily forested area. Trail slopes on the west side of the lake exceed 20 percent grade in many

locations. Portions of the trail to Inspiration Point traverse the side of a large cliff that was blasted out of bedrock and have precipitous drop-offs.

Soils

Soils in the park are described in the *Soil Survey of Teton County, Wyoming, Grand Teton National Park Area* (Young 1982). Soil names and descriptions in this section are from that publication. Soils in the general area surrounding Jenny Lake are derived from morainal debris that encircles the lake; glacial, talus deposits on the slopes west of Jenny Lake; and glacial outwash gravel underlying the flat meadow areas to the south and east of Jenny Lake. Existing vegetation is closely correlated with the soil types present. Soils on the trails are tightly compacted due to the extensive foot traffic. The soils descriptions are separated into the frontcountry and backcountry portions of the project area.

Frontcountry

The frontcountry area (including the South Jenny Lake developed area, Jenny Lake Overlook, and String Lake Outlet) is dominated by three different map unit soil types: Map Unit 3, Bearmouth gravelly loam; Map Unit 47, Taglake-Sebud association; and Map Unit 62, Tineman-Bearmouth gravelly loams, 0 to 3 percent slopes. These soils range from gravelly loam to very gravelly sandy loam and from stony sandy loam to very stony sandy loam. These soils are deep and well-drained. The water capacity for these soil units is low with a slight to moderate erosion hazard.

Backcountry

The backcountry portion of the project area is dominated by five different soil map units: Map Unit 26, Leighcan-Moran-Walcot association; Map Unit 36, Rock outcrop-Teewinot-Moran association; Map Unit 40, Rubble land-Walcott-Leighcan association; Map Unit 47, Taglake-Sebud association; and Map Unit 48, Taglake-Sebud association, steep. The range of soil textures include: stony sandy loam; very stony sandy loam; very stony sandy clay loam; and gravelly sandy loam. These soils are shallow to deep and well drained or shallow and excessively drained. These soils have a low to very low water-holding capacity and erosion hazards of slight, moderate, or severe due to susceptibility to slope erosion.

Vegetation

Other than the ESA of 1973, as amended, there are no federal laws governing vegetation in general; however, NPS has developed policies and guidance on the topic of vegetation management. Section 4.4 of the *NPS Management Policies 2006* addresses biological resource management including general vegetation management. Topics covered in this policy include native species, exotic species, and rare or unusual vegetation, among others. This policy states that NPS will maintain as parts of the natural ecosystems of parks all native plants. Specifically, Section 4.4.2.2, Management of Natural Landscapes, states “Landscape revegetation efforts will use seeds, cuttings, or transplants representing species and gene pools native to the ecological portion of the park in which the restoration project is occurring.” Section 4.4.1.1, Plant and Animal Population Management Principles, states “prevent the introduction of exotic species into units of the national park system, and remove, when possible, or otherwise contain individuals or populations of these species that have already become established in parks.”

Frontcountry

The frontcountry of the project area (south and east of Jenny Lake and the String Lake Outlet) is comprised of upland habitats associated with outwash floodplains. The vegetation communities on the outwash floodplains are comprised of sagebrush (*Artemisia* spp.) and dry lodgepole pine

(*Pinus contorta*) communities. Some common species in the sagebrush communities include mountain big sagebrush (*Artemisia tridentata* var. *vaseyana*), low sagebrush (*Artemesia arbuscula*), bitterbrush (*Purshia tridentata*), rabbitbrush (*Ericameria nauseosus*), thickstem aster (*Eurybia integrifolius*), sulfur buckwheat (*Eriogonum umbellatum*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), balsamroot (*Balsamorhiza sagittata*), and pussytoes (*Antennaria* spp). Commonly occurring plants in the forested sites include a mix of lodgepole pine, silky lupine (*Lupinus sericeus*), and Geyer's sedge (*Carex geyeri*). High visitor use in areas such as the paved pathways, building areas, and parking areas has affected and altered plant community composition. These areas have the highest concentrations and diversity of exotic plant species.

Backcountry

The backcountry area is comprised of upland and wetland habitats associated with shrublands, mixed conifer forests, and pockets of deciduous tree species. Tree species associated with the coniferous forest habitat include any combination of lodgepole pine, Douglas-fir (*Pseudotsuga menziesii*), and subalpine fir (*Abies lasiocarpa*). Although not common, limber pine (*Pinus flexilis*) is also present in this vegetation type. Common native forest understory species include pinegrass (*Calamagrostis rubescens*), Geyer's sedge, thickstem aster, oneflower helianthella (*Helianthella uniflora*), bluejoint big reedgrass (*Calamagrostis canadensis*), tufted hairgrass (*Deschampsia cespitosa*), and silky lupine. Shrub species that commonly occur in the understory include Saskatoon serviceberry (*Amelanchier alnifolia*), snowbrush ceanothus (*Ceanothus velutinus*), thinleaf huckleberry (*Vaccinium membranaceum*), and grouse whortleberry (*Vaccinium scoparium*).

Moister communities that occur along the western edge of the lake are dominated by Englemann spruce (*Picea engelmannii*), with subalpine fir occurring in small pockets. The understory is comprised of thinleaf huckleberry, white spirea (*Spiraea betulifolia*), mountain ash (*Sorbus scopulina*), and Geyer's sedge.

The wet, rocky talus areas leading to Inspiration Point have an overstory of lodgepole pine and subalpine fir and support an understory of thimbleberry (*Rubus parviflorus*), western brackenfern (*Pteridium aquilinum*), fireweed (*Chamerion angustifolium*), and American red raspberry (*Rubus idaeus*). Drier rock outcrops support an understory of Geyer's sedge, balsamroot, and sulfur buckwheat.

Shoreline vegetation is composed of graminoids, forbs, and shrubs associated with wetlands and wet conditions. Common species include aquatic sedge (*Carex aquatilis*), several reed grasses (*Calamagrostis* spp.), willows (*Salix* spp.), and chokecherry (*Prunus virginiana*).

Aspen (*Populus tremuloides*) are present in cool moist areas within all the vegetation types in the project area. These areas tend to have dense and diverse shrub, forb, and graminoid understories.

Exotic Plants

Exotic plant infestations represent a long-term management issue in the park. A noxious weed is a category of non-native invasive plant defined as a species designated by federal, state, or county government as injurious to public health, agriculture, recreation, wildlife or property (Sheley, Petroff, and Borman 1999). The NPS defines exotic plants as species that are not native to this county or to the area where they are growing; this definition includes the subset of exotic plants designated as noxious.

Exotic plants frequently occur along roadsides and trails and in other disturbed areas, including construction sites, gravel pits, and recently burned areas. Roadsides are uniquely vulnerable to exotic invasive species because of continual disturbance resulting from maintenance activities and the introduction of non-native plant propagules inadvertently transported on vehicles. Exotic plants are typically aggressive and difficult to control. There are many exotic plant species known to occur along the trails in both the frontcountry and backcountry areas associated with Jenny Lake. Many of these, including spotted knapweed (*Centaurea maculosa*), Dalmatian toadflax (*Linaria dalmatica*), musk thistle (*Carduus nutans*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), and houndstongue (*Cynoglossum officinale*) are Wyoming state-listed noxious weeds (USDA NRCS 2012). Other species present that are not on the state noxious weed list are cheatgrass (*Bromus tectorum*) and butter and eggs (*Linaria vulgaris*). All of these species colonize disturbed sites, often out-compete native vegetation, and, in some cases, spread into undisturbed areas.

A vegetation survey conducted in July 2012 found exotic invasive plants throughout the project area (Varga 2012), although their occurrence is higher in parking and visitor use areas in the frontcountry. Infested areas ranged in size from individuals to "large patches." Canada thistle was the most widely distributed species found, but other species were also prevalent, including musk thistle, Canada thistle, cheatgrass, spotted knapweed, and Dalmatian toadflax.

Species of Special Concern

No federally listed plant species were found in the project area during a survey conducted in July 2012 (Varga 2012). This survey did record two plant species that are of special interest to Grand Teton National Park (*Botrychium lunaria* and *Paeonia brownie*). These species are of interest to the park due to extremely limited distributions within park boundaries and general sensitivity to disturbance. The first, common moonwort (*Botrychium lunaria*), was located in the Hidden Falls vicinity. The second, Brown's peony (*Paeonia brownie*), was found around the visitor center parking lot area.

Environmental Consequences

Impact Analysis Methods

Impacts on soil and vegetation were considered for all parts of the project that could be disturbed by construction activities. Impacts were evaluated using the process described in "Methods for Analyzing Impacts." Impact threshold definitions are as follows. For the Preferred Alternative, the mitigation measures in Chapter 2 would be implemented as part of the project.

Threshold	Definition
Negligible	Soil would not be affected, or effects would not be measurable. Any effects on soil productivity or fertility would be slight and would occur in a relatively small area. For vegetation, individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.
Minor	Effects on soil characteristics such as erosion rate or ability to support vegetation would be detectable, but would affect a small area. Effects on native plants would be measurable, but would be localized in a small area. The viability of the plant community would not be affected and if left alone would recover.
Moderate	Effects on soil characteristics such as erosion rate or ability to support vegetation would be readily apparent, and would occur over a relatively large area. A change to vegetation would occur over a relatively large area in the native plant community and would be readily measurable in terms of abundance, distribution, quantity, or quality.

Major	Effects on soil characteristics such as erosion rate or ability to support vegetation would be readily apparent, and would be substantially altered over a large area. Effects on native plant communities would be readily apparent, and would substantially change vegetation community types over a large area.
Short-term	Effects would primarily exist during active implementation of a management action, such as construction. Within a year after construction, effects would be mitigated effectively by the measures described in chapter 2.
Long-term	Effects would extend more than a year beyond implementation of a management action.

Alternative A (No Action Alternative)

Impact Analysis

Under Alternative A, routine maintenance of trails and facilities would continue as funds are available, but overall upgrades and redesign to trails and facilities in the Jenny Lake area would not occur. These maintenance activities would be in previously disturbed locations. Continued routine maintenance of the water and wastewater systems would occur, with repairs as needed, but neither system would be replaced. Repairs to these existing system components would require excavations to patch or replace failed components, but such activities would occur in ground that was disturbed when the features were installed. Activities associated with repair of the water and wastewater systems and other routine maintenance could temporarily disturb soil and vegetation resources. This would result in short-term, direct, localized, minor, adverse effects to soils and short- and long-term, direct, localized, minor, adverse effects to vegetation resources until disturbed areas could be stabilized with standard erosion and sediment control measures and reseeded.

Under this alternative, trails would continue to be used in their current condition; existing user-created trails and eroded areas would not be addressed. As a result, soils may be disturbed and soil erosion may continue in off-trail areas most heavily used by visitors. Overall, under Alternative A there would be a long-term, indirect, localized, negligible to minor, adverse impact on soils from continued use of trails in their existing conditions that could increase erosion.

Use of trails in their existing conditions would also result in continued minor impacts to vegetation. Where trails are not currently well defined and in user-created trails, vegetation would continue to be trampled by foot traffic. Vegetation would also continue to be trampled where off-trail areas are used to access viewing areas. These effects to vegetation would be long-term, direct, localized, negligible to minor, and adverse.

Species of Special Concern

Maintenance activities that could occur under the No Action alternative would avoid areas containing Brown's peony and common moonwort to the extent possible.

Cumulative Impacts

Past development of park facilities has impacted soil and vegetation resources. Projects with the potential to impact these resources in the vicinity of Jenny Lake include road construction and construction of the multi-use pathway system from the town of Jackson to South Jenny Lake; trail maintenance on the southwest portion of the Jenny Lake Trail; replacement of the String Lake and Exum Bridges; and the Moose Water Wastewater Rehabilitation Project. Standard erosion and sediment control measures and revegetation practices are included as part of all the actions considered in this cumulative impact analysis. Therefore, the cumulative impact on soils and vegetation from other actions would be short- and long-term, direct, localized, negligible to minor, and adverse. The impacts of Alternative A, in combination with the impacts from other past, present, and reasonably foreseeable future actions, would result in short- and long-term,

direct and indirect, localized, minor, adverse cumulative impacts. The effects of Alternative A would contribute minimally to the cumulative impact on soils and vegetation resources.

Alternative B (NPS Preferred Alternative)

Impact Analysis - Frontcountry

Table 5 shows the approximate amounts of soil and vegetation that would be disturbed by the actions proposed in the Preferred Alternative. An estimated total of approximately 7.67 acres of soil and vegetation would be temporarily disturbed by construction in the frontcountry under Alternative B. The elements responsible for most of the disturbance would include replacement of the water and wastewater systems, and construction of the new restroom facility, the Public Boat Launch site plan, the Visitor Center site plan, and the Gateway Plaza (See Table 5). Most of the construction would occur in areas that have been previously disturbed. In the frontcountry, most of the disturbance would occur in the sagebrush vegetation type; however, some tree removal would also occur.

Development and construction actions proposed under this alternative would result in short-term, direct, localized, minor, adverse impacts from soil disturbance. General construction and soils-specific mitigation measures that would be used for project work would reduce adverse impacts to soils from this activity. The proposed trail alignments that would be constructed would allow visitors better access to viewing areas while staying on designated paths. Better-defined trails would potentially reduce human use and trampling of off-trail areas, thereby potentially resulting in a reduction in disturbance and erosion of soils in off-trail areas. These actions would result in long-term, indirect, localized, negligible to minor, beneficial impacts to soils.

Construction and development actions proposed under this alternative would result in short-term, direct, localized, minor, adverse impacts to vegetation. General construction and vegetation-specific mitigation measures that would be used for project work would reduce adverse impacts to vegetation from this activity. Trail rehabilitation actions would potentially reduce trampling of vegetation in off-trail areas. Following soil de-compaction efforts in trampled areas, it is anticipated that plant communities could re-establish. There would be a long-term, indirect, localized, negligible, beneficial impact on vegetation as a result of trail alignment that should reduce trampling in off-trail areas. Trail realignment would remove approximately 80 trees, as well as mature sagebrush plants. In addition, approximately 50 trees may be removed to enlarge the viewing areas at the Lake, Inlet, and Aspen Overlooks. Tree removal would be a localized, direct, long-term, minor, adverse impact.

Trail circulation would be improved and old trails would be rehabilitated resulting in a long-term improvement to vegetation and soil conditions on 5,450 square feet (see Table 5). Approximately 12,050 square feet would be rehabilitated associated with the work proposed for the Reimer's Path and Fuel Tank Relocation.

Table 5. Soil and Vegetation Disturbance.

Project Feature	Alternative B: Preferred Alternative (Note: Areas are approximate)		
	Construction Disturbance (Square Feet)	Reclamation (Square Feet)	Permanent Disturbance (Square Feet)
Frontcountry			
New restroom (+12)	3,150	700	2,450
New vault toilets (+2)	900	200	700
Visitor center site plan	8,500	2,300	6,200
Visitor center drop-off	2,500	1,500	1,000
Trails plan (circulation)	18,400	23,850	-5,450
Creek Walk	3,400	3,900	-500
Lake Overlook	700	200	500
Inlet Overlook	300	150	150
Aspen Overlook	250	100	150
Lodgepole Knoll	350	100	250
Aspen Knoll	1,300	1,500	-200
Gateway Plaza	3,500	500	3,000
Rock Beach Site Plan	2,000	1,000	1,000
Boat House Overlook, Beach, and Peninsula	3,900	3,400	500
Reimer's Path and Fuel Tank Relocation	2,500	12,050	-9,550
Cottonwood Creek Beach	1,000	700	300
Jenny Lake Trail (SW)	2,000	2,000	0
Public Boat Launch	15,450	5,150	10,300
Water System	138,188	100,188	38,000
Wastewater System	108,900	108,900	10,000
Exum Vault Toilet	500	250	250
Campground Improvements	2,600	1,175	425
Jenny Lake Overlook	10,000	1,600	3,200
String Lake Outlet	4,000	1,500	1,500
Subtotal Frontcountry	**334,2888 (7.67 acres)**	**272,913 (6.27 acres)**	**64,175 (1.5 acres)**
Backcountry			
West Boat Dock	2,120	2,120	0
Dock Bypass/Stock Trail	2,375	1,250	1,125
Cascade Creek Overlook and Bridge	4,500	2,000	2,500
Confusion Junction Reroute	0	15,850	-15,850
South Cascade Creek Trail Repair	1,905	1,905	0
Hitching Post	0	3,000	-3,000
Hidden Falls Overlook	2,600	350	2,250
Hidden Falls Bridges	1,550	800	750
Inspiration Point Trail	7,882	7,882	0
Inspiration Point	1,400	1,800	-400
West Cascade Bridge	300	300	0
North Cascade Creek Trail and Reroute	15,320	11,895	3,425
Subtotal Backcountry	**39,952 (0.92 acre)**	**49,152 (1.13 acres)**	**-9,200 (-0.2 acre)**
Total Frontcountry and Backcountry	**374,240 (8.59 acres)**	**322,065 (7.4 acres)**	**54,975 (1.3 acres)**

The soil and vegetation mitigation measures in Chapter 2 would be incorporated into an NPS approved soil erosion control and vegetation management plan. These measures would minimize adverse soil erosion impacts and help to re-establish native vegetative cover. Revegetation would be accomplished through application of native locally collected grass, forb, and shrub seed. Some trees may be transplanted as would some native nursery grown shrubs and forbs. Three or four years after restoration and seeding, disturbed areas would likely have a stable herbaceous cover of grasses, forbs, and seedling sagebrush, with small sagebrush plants in about five or six years and medium- to full-sized sagebrush plants likely approaching maturity after about 20 years. As a result, construction would have short- and long-term, direct, localized, minor, adverse effects on soils and vegetation.

Control of exotic plant species during construction would employ BMPs and other mitigation measures described in Chapter 2 and would be followed by at least three years of monitoring and treatment of infestations. Monitoring and treatments of any remaining infestations would be conducted as part of the NPS' ongoing control of exotic invasive species.

Species of Special Concern

Brown's peony, which has limited distribution in the park, was found within the project area. Project activities, including construction and staging, would be excluded from areas containing Brown's peony. Two of the three populations would be affected, but at least 50 percent of each population could be avoided. Mitigation measures listed in Chapter 2 would be implemented to minimize the potential for impacts to this species.

Impact Analysis - Backcountry

Table 5 shows the approximate areas of soil and vegetation that would be disturbed by the actions proposed in the Preferred Alternative. A total of approximately 0.92 acres of soil and vegetation would be temporarily disturbed by construction in the backcountry under Alternative B. Components responsible for most of the disturbances would include the Hidden Falls Overlook and North Cascade Creek Trail and Reroute (see Table 5). Disturbance in the backcountry would mostly occur in the forested vegetation types and some tree removal would occur.

Rehabilitation actions proposed under this alternative would result in a short-term, direct, localized, minor, adverse impact to soils and vegetation from ground disturbance. General construction and soils- and vegetation-specific mitigation measures that would be used for project work would reduce adverse impacts to soils and vegetation from this activity. For example, erosion control BMPs, including protection measures such as sediment traps, silt fences, erosion check screens/filters, jute mesh, and hydro mulch, would be used if necessary to prevent the loss of soil. Compacted soils would be scarified and original contours re-established. Soil decompaction and seed applications would allow plant communities to re-establish in heavily trampled areas. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. The proposed trail rehabilitation would allow visitors better access to viewing areas while staying on designated paths. With better-defined trails, human use and trampling of off-trail areas would potentially be reduced, thereby potentially reducing disturbance and erosion of soils in off-trail areas. There would be a long-term, indirect, localized, negligible, beneficial impact on vegetation and soils as a result of trail rehabilitation that should reduce trampling in off-trail areas.

Some tree removal would be necessary to implement the project in the backcountry. Construction of the Dock Bypass/Stock Trail would result in the removal of approximately 15 trees, the Cascade Creek Overlook and Bridge would result in removal of approximately 15, and the North Cascade Creek Trail and reroute would result in removal of approximately 20 trees. Approximately 10 trees may be removed at the Hidden Falls area. Tree removal would result in a long-term, direct, localized, minor, adverse impact to vegetation.

As described above for the frontcountry, soil and vegetation mitigation measures in Chapter 2 would be incorporated in an NPS approved soil erosion control and vegetation management plan to minimize adverse soil erosion impacts and establish native vegetative cover. Revegetation would be accomplished via seeding with native grass, forb, and shrub mixes. In the backcountry, some transplanting of salvaged shrub materials may occur. As a result, construction would have short- and long-term, direct, localized, minor, adverse effects on soils and vegetation. Mitigation measures for control of exotic plant species would also be followed.

Species of Special Concern

Common moonwort, which has limited distribution in Grand Teton National Park, was located in the backcountry project area. Mitigation measures would be implemented to exclude these areas from use as construction or staging areas, thereby minimizing the potential for impacts to this species.

Cumulative Impacts

Past development of park facilities has impacted soil and vegetation resources. Actions with the potential to impact soil and vegetation resources in the vicinity of Jenny Lake are the same as those described for the No Action alternative. Standard erosion and sediment control measures and revegetation practices are included as part of the actions considered in this cumulative impact analysis. Therefore, the cumulative impact on soils and vegetation from other actions would be short- and long-term, direct, localized, negligible to minor, and adverse. The impacts of Alternative B, in combination with the cumulative impacts from other past, present, and reasonably foreseeable future actions, would result in long-term, direct, localized, negligible to minor, adverse cumulative impacts. The effects of Alternative B would contribute minimally to the adverse cumulative impacts on soils and vegetation resources.

Wildlife, Including Special Status Species

Affected Environment

Grand Teton National Park provides habitat for a variety of wildlife species, including at least 61 native mammals, four reptiles, six amphibians, 12 fish, and 299 birds (NPS 2000a). Although the Jenny Lake area is a developed area and the presence of humans, human-related activities, and facilities have altered much of the native wildlife habitat in the project area, wildlife still use the area. Species using habitat within portions of the Jenny Lake project area are subject to living in disturbed areas with high concentrations of humans from late spring through fall.

Species occurring in the Jenny Lake area include those that occupy sagebrush-grasslands, talus slopes, or lodgepole pine forest habitats, during all or portions of their life cycles. Some species that require aquatic habitat are expected to be present due to the proximity of the project area to Jenny Lake and Cascade Creek. Surveys of the project area have been conducted to identify areas used by pika and other wildlife. A list of species that use these habitats and may be found in the project area is included in Appendix C.

Special Status Species

Federal Species

The USFWS has identified the following listed, candidate, or proposed threatened and endangered species as potentially occurring in Grand Teton National Park (Table 6; USFWS 2012). This list is from the USFWS's May 2012 species list for Teton County, Wyoming, which fulfills the Service's requirement, under section 7(c) of the ESA of 1973, as amended, 16 U.S.C. 1531 *et seq.*, to provide a list of endangered and threatened species upon request for federal actions and NEPA compliance. In addition to the species identified on the May 2012 list, the North American wolverine is also included in Table 6 because it was "proposed" for listing under the ESA in February 2013. See Appendix C for detailed information about each of these species as well as for the bald eagle and gray wolf, listed by the USFWS as species of special concern in Teton County.

Table 6. USFWS Threatened and Endangered Species List for Teton County Wyoming.

Species/Critical Habitat	Scientific Name	Status	Habitat
Greater Sage-grouse	*Centrocercus urophasianus*	Candidate	Sagebrush communities
Grizzly Bear	*Ursus arctos horribilis*	Threatened	Montane forests
North American Wolverine	*Gulo gulo luscus*	Candidate / Proposed	Subalpine to alpine
Yellow-billed Cuckoo (Western)	*Coccyzus americanus*	Candidate	Riparian areas west of Continental Divide
Canada Lynx	*Lynx canadensis*	Threatened	Montane forests
Canada Lynx Critical Habitat Designated areas include boreal forest landscapes within Fremont, Lincoln, Park, Sublette, and Teton Counties of Wyoming (see 50 CFR 17.95(a))			

Species of Special Concern

The *Wyoming State Wildlife Action Plan* (WGFD 2010) identifies wildlife species of greatest conservation need in the state, many of which are also identified by USFWS as priority species for conservation or monitoring. Table 7 lists the special-concern species that use the habitat types found in the project area. These species are discussed in Appendix C by habitat type.

Table 7. Species of Special Concern with Potential Habitat in the Project Area.

Common Name, *Scientific Name*	WGFD Status[a]	Habitat	Potential to Occur in Project Area
Reptiles and Amphibians			
Northern leopard frog, *Rana pipiens*	NSS4	Riparian	Unlikely
Western boreal toad, *Anaxyrus boreas boreas*	NSS2	Riparian	Likely
Northern rubber boa, *Charina bottae*	NSS3	Foothills, lower montane,	Possible
Columbia spotted frog, *Rana luteiventris*	NSS3	Riparian, aquatic	Likely
Valley gartersnake, *Thamnophis sirtalis fitchi*	NSSU	Plains, foothills, montane, near water	Possible
Birds			
Trumpeter swan, *Cygnus buccinator*	NSS2	Wetlands, streams	Unlikely
Northern goshawk, *Accipiter gentilis*	NSS4	Forests	Likely
Swainson's hawk, *Buteo swainsoni*	NSS4	Sagebrush	Likely
Bald eagle, *Haliaeetus leucocephalus*	NSS2	Riparian, rivers	Likely

Common Name, *Scientific Name*	WGFD Status[a]	Habitat	Potential to Occur in Project Area
Long-billed curlew, *Numenius americanus*	NSS3	Sagebrush	Unlikely
Short-eared owl, *Asio flammeus*	NSS4	Sagebrush	Likely
Great gray owl, *Strix nebulosa*	NSS4	Forests	Likely
Northern pygmy-owl, *Glaucidium californicum*	NSS4	Forests	Likely
Sage thrasher, *Oreoscoptes montanus*	NSS4	Sagebrush	Likely
Bobolink, *Dolichonyx oryzivorus*	NSS4	Sagebrush	Unlikely
Brewer's sparrow, *Spizella breweri*	NSS4	Sagebrush	Likely
Ash-throated Flycatcher, *Myiarchus cinerascens*	NSS3	Riparian	Unlikely
Mammals			
American pika, *Ochotona princeps*	NSSU	Boulder-covered hillsides, talus slopes	Likely
Bighorn sheep, *Ovis Canadensis*	NSS4	Forests, mountain foothill shrublands & grasslands	Possible
Gray wolf, *Canis lupus*	Trophy Game	Coniferous forest, mountain-foothill shrublands and grasslands	Possible
Moose, *Alces alces*	NSS4	Forests, aspen cottonwood riparian, mountain-foothill shrubland	Likely
Vagrant shrew, *Sorex vagrans*	NSS3	Forests, riparian, sagebrush	Likely
Dwarf shrew, *Sorex nanus*	NSS3	Forests, mountain-foothill shrublands	Possible
Water vole, *Arvicola terrestris*	NSS3	Riparian	Unlikely
Long-eared myotis, *Myotis evotis*	NSS2	Forests	Likely
Little brown myotis, *Myotis lucifugus*	NSS3	Forests	Likely
Long-legged myotis, *Myotis volans*	NSS2	Forests	Likely
Big brown bat, *Eptesicus fuscus*	NSS3	Forests	Likely
Townsend's big-eared bat, *Corynorhinus townsendii*	NSS2	Forests	Likely
Western small-footed myotis, *Myotis ciliolabrum*	NSS3	Forests	Likely

[a] Concern categories are from Cerovski 2003. Wyoming Game and Fish Department (WGFD) native species status (NSS) categories are:

NSS2 = Populations restricted or declining in numbers and/or distribution; extirpation in Wyoming is not imminent AND ongoing significant loss of habitat.

NSS3 = Populations restricted or declining in numbers and/or distribution; extirpation in Wyoming is not imminent AND habitat is restricted or vulnerable but no recent or on-going loss; species is sensitive to human disturbance.

NSS4 = Species is widely distributed; population status and trends in Wyoming are assumed stable AND habitat is restricted or vulnerable but no recent or on-going significant loss; species is sensitive to human disturbance.

NSSU = This system cannot be used for classifying some species because necessary information is lacking. These species are placed in a separate status category as NSS Unknown (NSSU) until additional information is obtained. NSSU species were recommended to receive the termed Species of Greatest Conservation Needs (SGCN) designation because obtaining a greater understanding regarding population numbers and distributions of these species is necessary in determining their conservation status.

Migratory Birds

The Migratory Bird Treaty Act, 16 U.S.C. 703, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs. Neotropical migratory birds are of particular concern to wildlife managers because they have been experiencing severe population declines throughout their North American range (Askins et al. 1990). Habitat fragmentation and loss of winter range are among factors believed responsible for these declines (Hutto 1988; Robbins et al. 1989). Neotropical migratory birds include raptors, passerines, and shorebirds that breed in North America, but migrate to Mexico, Central and South America for the winter. In Wyoming, more than 160 bird species are considered neotropical migrants (Cerovski et al. 2001) with peak migration periods occurring in May and September through early October. Nesting is typically initiated from mid-May to mid-June and most young fledge nests sometime in June to late-July; however these dates vary annually due to snow melt and when deciduous trees and shrubs begin producing leaves in the spring. Due to the mixture of habitats present, a variety of migratory bird species may occur in the project area.

Environmental Consequences

Impact Analysis Methods

Impacts on wildlife, including special status species, and their habitats were evaluated using the process described in the "Methods for Analyzing Impacts" section at the beginning of this chapter. Impacts on threatened and endangered species were assessed using the *Final Endangered Species Consultation Handbook* (USFWS and National Marine Fisheries Service 1998). According to this handbook, a "not likely to adversely affect" determination is appropriate when the effects on listed species are expected to be discountable, insignificant, or completely beneficial. Discountable effects are defined as those that cannot be meaningfully measured. The handbook states that a "no effect" determination is appropriate when the "action agency determines its proposed action will not affect a listed species or designated critical habitat." For this analysis, a "no effect" determination is equated with a "negligible" impact threshold.

Section 7(a)(1) of the ESA requires federal agencies to consult with the USFWS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed or proposed species or destroy or adversely modify designated or proposed critical habitat. In August 2012, the NPS sent a scoping letter to the USFWS, Wyoming Ecological Services Office, notifying them of the Jenny Lake Renewal project. The NPS will use this EA as the consultation document pursuant to section 7. This document provides an impact determination for each federally listed species under each alternative. The impact determinations as defined under section 7 include no effect; may affect, not likely to adversely affect; and may affect, is likely to adversely affect. This EA will be forwarded to the USFWS for its concurrence with these determinations of effect. Once concurrence has been received from the USFWS, section 7 consultation will be complete.

Impact threshold definitions for wildlife and their habitats are as follows. The mitigation measures in Chapter 2 would be implemented as part of the project and were considered in the analysis for the action alternative.

Threshold	Definition
Negligible	General wildlife and species of concern - The action might result in a change in wildlife, but the change would not be measurable or would be at the lowest level of detection and so slight that they would not be of any measurable consequence to the population. Threatened and endangered species - No federally listed species would be affected, or the alternative would affect an individual of a listed species or its critical habitat, but the effects would be so small that it would not be of any measurable consequence to the protected individual or its population. Negligible effect would equate with a “no effect” determination in ESA terms.
Minor	General wildlife and species of concern - The action might result in a detectable change, but the change would be slight and have a local effect on a population. This could include changes in the abundance or distribution of individuals in a local area, but not changes that would affect the viability of local populations. Threatened and endangered species - Individuals of a listed species or its critical habitat may be affected, but the effect would be relatively small. Minor would equate with a “may affect” determination in ESA terms and would be accompanied by a statement of “may affect but not likely to adversely affect" the species.
Moderate	General wildlife and species of concern - The action would result in a clearly detectable change in a population. This could include changes in the abundance or distribution of local populations, but not changes that would affect the viability of regional populations. Threatened and endangered species - An individual or population of a listed species or its critical habitat would be noticeably affected. The effect could have some long-term consequence to the individual, population, or habitat. Moderate would equate with a “may affect” determination in ESA terms and would be accompanied by a statement of “likely” or “not likely to adversely affect” the species.
Major	General wildlife and species of concern - The action would be severely adverse or exceptionally beneficial to a population. The effects would be substantial and highly noticeable, and they could result in widespread change. This could include changes in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or return to a sustainable level (beneficial). Threatened and endangered species - Individuals of a listed species or its critical habitat would be noticeably affected, with some long-term consequence to the individual, population, or habitat. Major would equate with a “may affect” determination in ESA terms and would be accompanied by a statement of “likely to adversely affect" the species.
Short-term	Impact has a duration less than or equal to the period of construction plus one additional year post-construction.
Long-term	Impact has a duration greater than one year post-construction.

Alternative A (No Action Alternative)

Impact Analysis for General Wildlife

Alternative A would maintain the Jenny Lake area in its current state, but would allow for replacement of facilities and infrastructure in-kind on an as needed basis. The project area would continue to provide habitat for many wildlife species, although the quality of the habitat would remain low due to the existing development and levels of human use. Human activity also results in a buffer of unused habitat around the developed area, the size depending on species and individual levels of tolerance for human activities. With no changes in habitat and human use levels, wildlife use of the area would generally remain as it is currently. Therefore, Alternative A would continue to have long-term, indirect, localized, negligible, adverse impacts on wildlife and their habitats.

Cumulative Impacts

Wildlife populations and habitat in the Jenny Lake area have been substantially altered in the past by NPS development and presence of people in this heavily visited area. These effects would continue. Other nearby developments, such as the park road and recently constructed multi-use pathway system from Moose Junction to South Jenny Lake, also could negatively affect wildlife, disturbing and altering the behavior of individual animals. Other recently implemented, in-progress, and foreseeable future projects with the potential to affect the same resources as the Jenny Lake Renewal Project include trail maintenance on the southwest portion of the Jenny Lake Trail, the Exum Bridge replacement, the String Lake Bridge replacement, and the Moose Water and Wastewater Rehabilitation Project.

All of these actions would result in a long-term, direct and indirect, negligible, adverse impact to wildlife habitat and populations in localized areas. Reasonably foreseeable NPS activities in the area, including construction activities related to replacing utility infrastructure and minor facilities, would add short-term, direct, localized, negligible, adverse impacts to existing impacts. When the adverse effects of these actions are added to the long-term, indirect, localized, negligible, adverse effects of Alternative A, there would be a long-term, indirect, localized, negligible to minor, adverse cumulative impact on wildlife. Alternative A would add a small increment to the overall adverse cumulative impact.

Impact Analysis for Special Status Species

The No Action alternative would maintain the Jenny Lake area in its current state, but would allow for replacement of facilities and infrastructure in-kind on an as needed basis. The project area would continue to provide habitat for some special status wildlife species, although the quality of the habitat would remain low due to existing development and levels of human use. Human activity also results in a buffer of unused habitat around the developed area, the size depending on species and individual levels of tolerance for human activities. With no changes in habitat and human use levels, use of the area by special status species would generally remain as it is currently.

The behavior of individual grizzly bears may continue to be altered due to the presence of people and facilities, but no population level impacts on this species would occur due to this alternative. Therefore, Alternative A would continue to have a long-term, indirect, localized, negligible, adverse impact on grizzly bears in the area. There would be *no effect* on grizzly bears from Alternative A.

For Canada lynx and wolverine, most individuals would avoid the developed area and adjacent habitats. Transient individual animals may occasionally move through the area, although this would be uncommon. The behavior of individual animals could be altered due to the presence of people and facilities, but no population level impacts on these species would occur due to this alternative. Therefore, Alternative A would continue to have the potential for a long-term, indirect, localized, negligible, adverse impact on Canada lynx and wolverine in the area. There would be *no effect* on Canada lynx and wolverine from Alternative A.

Habitat for sage-grouse is marginal within the project area and the presence of this species would be uncommon. The behavior of individual animals could be altered due to the presence of people and facilities, but no population level impacts on these species would occur due to this alternative. Therefore, Alternative A would continue to have the potential for a long-term,

indirect, localized, negligible, adverse impact on sage-grouse. There would be *no effect* on sage-grouse from Alternative A.

Habitat for yellow-billed cuckoo is not present in the project area. Existing activities in the Jenny Lake project area further limit the suitability of the area for yellow-billed cuckoos, especially during their breeding and nesting season (May-July) when they are sensitive to disturbance. Individuals of this species would likely continue to avoid this area due to the lack of habitat and the presence of people and facilities, but no population level impacts on these species would occur due to this alternative. Alternative A would continue to have the potential for a long-term, indirect, localized, negligible, adverse impact on yellow-billed cuckoo. There would be *no effect* on yellow-billed cuckoo from Alternative A.

The current use of the Jenny Lake area results in adverse effects on several state special concern species including migratory birds, mammals, bats, and amphibians. Under the No Action alternative, the primary impacts to the special concern species that have the potential to use habitat within the project area would continue to be related to high visitor use of the area. Some habitat remains within the Jenny Lake area for special concern species, but densities are likely reduced when compared to undisturbed habitats. Some species, such as bald eagles, other raptors, and trumpeter swans are likely displaced from using habitats within the Jenny Lake area because of high levels of human activity and/or habitat alteration. Human activity in the area also results in a buffer of unused habitat around the developed area, the size depending on species and individual levels of tolerance for human activities. These species may continue to have their behavior altered due to the presence of people and facilities, but no population level impacts on these species would occur from this alternative. No actions that could lead to the take of a migratory bird, their young, eggs, or nests, would occur under the No Action alternative. Alternative A would continue to have the potential for long-term, indirect, localized, negligible, adverse impacts.

Cumulative Impacts

The past development of facilities and presence of people in the Jenny Lake area likely have substantially altered the habitat use and behavior of all the special status species with the potential to occur in the immediate area. These effects would continue. Other nearby developments, such as the park road and recently constructed multi-use pathway system from the town of Jackson to South Jenny Lake, also could negatively affect the special status species, disturbing and altering the behavior of individual animals. Other recently implemented, in-progress, and foreseeable future projects with the potential to affect the same resources as the Jenny Lake Renewal Project include trail maintenance on the southwest portion of the Jenny Lake Trail, the Exum, West Cascade, and String Lake Bridge replacements, and the Moose Water and Wastewater Rehabilitation Project. Reasonably foreseeable NPS activities in the area, including construction activities related to replacing utility infrastructure and minor facilities, would add short-term, localized, negligible to minor, adverse impacts to existing impacts. Past, present, and foreseeable NPS actions could have long-term, direct and indirect, localized, negligible to minor, adverse cumulative impacts on the special status species when combined with the effects of Alternative A. However, Alternative A would add a small increment to the overall adverse cumulative impact.

Alternative B (NPS Preferred Alternative)

Impact Analysis for General Wildlife

Alternative B proposes a number of upgrades and improvements to facilities, trails, and infrastructure that would result in both beneficial and adverse effects on wildlife in the area. Table 5 in the *Geologic Resources and Vegetation* section shows approximate areas of disturbance for the various actions proposed under this alternative. Overall, construction activities and use of the area under Alternative B would be expected to result in short- and long-term, direct and indirect, localized, negligible to minor, adverse impacts to wildlife and their habitat in the project area.

As noted under the *Geologic Resources and Vegetation* section, the frontcountry area is of much-reduced habitat value. Most wildlife in the Jenny Lake area has already been affected by people and development of the area. The primary effects would be short-term displacement of some wildlife from noise associated with construction activities and increased presence of humans in staging and work areas. Construction of the new restroom building, the Public Boat Launch site plan, the Visitor Center site plan and the Gateway Plaza would result in the long-term disturbance of 22,000 square feet. Trail circulation would be improved and old trails would be rehabilitated resulting in a long-term reduction of disturbance of 5,450 square feet of habitat. Minor clearing would occur at the Lake, Inlet, and Aspen Overlooks resulting in a reduction of approximately 50 trees. Water and wastewater system upgrades would result in temporary disturbance of 5.6 acres. These areas would be revegetated after project completion. These activities would displace wildlife during project implementation but most displaced animals would likely relocate to similar habitat within the surrounding area. In the long-term after rehabilitation, habitat conditions in the frontcountry would be similar to existing conditions.

In the backcountry, existing habitat is less disturbed but the quality is still affected by the high number of visitors using the area. Effects would be similar to those in the frontcountry areas, with the primary effects consisting of short-term displacement of some wildlife from noise associated with construction activities and increased human presence. This would be greater in the backcountry due to use of helicopters for delivery of some construction supplies (e.g., for the Cascade Canyon and Hidden Falls Bridges). Overall, there would be a temporary disturbance of about 0.92 acres of habitat in the backcountry, but 1.13 acres would be rehabilitated (see Table 5). Tree removal would occur as part of the work at several points along the backcountry trail system. The current estimate of tree removal throughout the backcountry is 60 trees of various species and sizes. Implementation of an NPS-approved restoration plan that includes revegetation with native species and control of exotic invasive plant species would result in the return of wildlife habitat that would approach maturity in about 15 years for sagebrush areas and 30 years for forest habitat. During this restoration period, the long-term impacts would remain localized and negligible to minor but could be adverse or beneficial, depending on whether each species had preferences for features such as edge effect or immature versus mature vegetation. The long-term impacts would end when mature habitat returned.

The permanent loss of a relatively small number of trees in both the frontcountry and backcountry (see Table 5) has the potential to adversely affect some birds that use and depend on these trees for nesting, foraging, or shelter, although this loss would occur in an area with existing high human use and low habitat quality. No actions would affect areas that are important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of wildlife species. As described in the mitigation measures

in Chapter 2, other actions such as surveys and avoidance would be used to ensure that nests or dens were not disturbed. Almost all animals would be able to move into undisturbed areas outside construction zones. There would be no effect on wildlife in the area during the winter.

Cumulative Impacts

Wildlife populations and habitat in the Jenny Lake area have been substantially altered in the past by the NPS development and presence of people in this heavily visited area. These effects would continue. Other nearby developments, such as the park road and recently constructed multi-use pathway system from the town of Jackson to South Jenny Lake, also could negatively affect wildlife, disturbing and altering the behavior of individual animals. Other recently implemented, in-progress, and foreseeable future projects with the potential to affect the same resources as the Jenny Lake Renewal Project include trail maintenance on the southwest portion of the Jenny Lake Trail, the Exum, West Cascade, and String Lake Bridge replacements, and the Moose Water and Wastewater Rehabilitation Project.

All of these actions would result in short- and long-term, direct and indirect, negligible to minor, adverse impacts to wildlife habitat and populations in localized areas. When the adverse effects of these other actions are added to the effects of Alternative B, there would be a short- and long-term, localized or widespread, negligible to minor, adverse, cumulative impact on wildlife. Alternative B would add a small increment to the overall adverse cumulative impact.

Impact Analysis for Special Status Species

Under the Preferred Alternative, the project area would continue to provide habitat for some special status wildlife species, although the quality of the habitat would remain low due to the existing development and levels of human use, particularly in the frontcountry. Human activity also results in a buffer of unused habitat around the developed area, the size depending on species and individual levels of tolerance for human activities. Table 5 in the *Geologic Resources and Vegetation* section shows acreages of disturbance and rehabilitation/revegetation for the various actions proposed under this alternative. See the *General Wildlife* section above for examples of the types of impacts related to specific disturbance activities. With project implementation, use of the area by special status wildlife would be reduced in the short-term during construction.

Ongoing human activity would continue to deter grizzly bears from using the Jenny Lake area, but they would be expected to infrequently pass through both the frontcountry and backcountry portions of the project area. No construction activities would affect areas that are important for bear breeding, denning, or foraging. Individual grizzlies that use habitats near the project area for foraging may avoid the area altogether due to construction activities and noise during the construction period. Any displacement or disturbance of individual grizzly bears, or their food sources, that would occur as a result of construction activities would be confined to the project's immediate areas, and limited in spatial and temporal extent. Adverse impacts associated with potential food-conditioning of bears would be addressed by mitigation measures. Consequently, construction activities would have short-term, direct, localized, minor, adverse impacts on grizzly bears in the area. None of the changes stemming from Alternative B would result in population level impacts for this species. Alternative B *may affect, but is not likely to adversely affect* grizzly bears.

Although uncommon, transient individual Canada lynx and wolverines may move through the project area. Their presence is more likely in the backcountry than the frontcountry because of

the higher number of visitors in the frontcountry. The behavior of a few individual animals could be altered due to the presence of people and construction activities, which could result in short term displacement of individuals. Therefore, Alternative B could have the potential for a short-term, direct, localized, negligible, adverse impact on Canada lynx and wolverine in the area. None of the changes stemming from Alternative B would result in population level impacts for these species. Alternative B *may affect, but is not likely to adversely affect* Canada lynx or wolverine.

Alternative B would have short-term, direct, localized, negligible to minor, adverse impacts on greater sage-grouse and its habitat because of the low quality of habitat in the frontcountry portion of the project area. Disturbance would occur in sagebrush habitat, but none of the disturbed area is in core-area sagebrush habitat. Due to human activity in the project area, it is anticipated that the area receives little to no use by this species. Project activities would not directly or indirectly affect any known greater sage-grouse leks. Revegetation of disturbed areas in accordance with an NPS-approved plan would begin promptly after site-disturbing activities ended. All disturbed sagebrush areas would be revegetated with native seed mixtures and eventually would be restored. Because there would be no permanent loss of sagebrush habitat, impacts of the project would be negligible after sagebrush habitats were restored. No impacts to sage-grouse are expected in the backcountry because of the lack of habitat for this species. Alternative B *may affect, but is not likely to adversely affect* greater sage-grouse.

Suitable habitat for yellow-billed cuckoo does not exist within either the frontcountry or backcountry portions of the project area. Therefore, no habitat for this species would be affected by Alternative B. If present in the vicinity, this species may avoid the project area during construction. Any construction-related adverse impacts would be negligible because the cuckoo is not expected to occur in the area; if present in the area it is more likely to occur along the Snake River corridor where suitable habitat is abundant. Alternative B *may affect, but is not likely to adversely affect* yellow-billed cuckoo.

Impacts to state species of concern such as bald eagles, trumpeter swans, neotropical migratory birds, and amphibians as a result of implementation of Alternative B would be primarily a result of noise disturbance from construction activity and habitat disturbance. Noise from construction activities has the potential to disturb wildlife in the area, but this disturbance is expected to be of low magnitude and of short-duration since construction noise would cease as soon as the project was complete. A direct loss of some individuals could occur during construction activities whereas other individuals would not be permanently displaced. Wildlife such as some bird, amphibian, or reptile species may be temporarily or permanently displaced to similar habitat in the surrounding area.

The Preferred Alternative would result in impacts to special concern species that use marginally suitable sagebrush habitat in the frontcountry portion of the project area; the backcountry does not contain substantial amounts of sagebrush habitat therefore actions in the backcountry would not impact these species. Species that use sagebrush habitat in the frontcountry would experience a temporary decline in habitat availability and quality. The presence of construction personnel and equipment may also cause these species to temporarily avoid the area. As a result, the project would have a short- and long-term, direct, localized, minor, adverse effect on these species until the restored sagebrush habitat approaches maturity. Reclamation of redundant and user-created trails would improve some habitat. Habitat changes would not be large enough to cause measurable population changes in any of these species.

The Preferred Alternative would result in impacts to special concern species that use forest habitats in both the frontcountry and backcountry portions of the project area. Species that use forest habitat in the frontcountry would experience a temporary decline in habitat availability and quality. Species that use forest habitat in the backcountry would experience a temporary decline in habitat availability and quality on approximately 0.92 acres during project construction. Forest habitat dominates the area along the southwest portion of the Jenny Lake Trail and trails leading up to Hidden Falls and Inspiration Point in the backcountry, as well as along the lake in the frontcountry. The southern portion of the project area also has scattered forested habitat intermixed with sagebrush habitat. The presence of construction personnel and equipment may cause these species to temporarily avoid the area. The use of helicopters to bring supplies into the backcountry is expected to cause short-term disturbance of special status wildlife species that use this area. Adverse effects on special concern species in forest habitat would be short- and long-term, direct, localized, and negligible or minor because project disturbances would occur only in small amounts of this habitat type. Impacts would gradually decline as restored forest areas approach maturity.

American pika is present in talus slopes throughout the project area and may be disturbed by project activities. Impacts on pika would be minimized by surveying potential rock harvesting sites and refraining from harvesting rocks in areas occupied by pika. Construction of the new spur trail near the Hidden Falls viewing area in particular may disturb individual pikas and may cause minor adverse impacts to this species. Reclamation of some trails would result in a localized improvement in habitat in the backcountry and frontcountry (see Table 5).

Impacts to species of concern that occur in wet habitats such as riparian areas, lakes, and streams would be limited because of the small size of the habitat affected. Boreal western toads and spotted frogs may be impacted by the presence of construction equipment. Species such as swans and bald eagles may be disturbed by construction activity and thus may avoid the area. Impacts to these species would be short-term, direct, localized, negligible to minor, and adverse.

Direct and indirect effects to bird species of special concern and/or neotropical migratory birds resulting from the Preferred Alternative would be greater than those described in Alternative A. Direct impacts from Alternative B would include permanent loss of a relatively small number of trees; however, these losses would primarily occur in areas with existing high human use that represent low habitat quality (e.g., overlooks, Hidden Falls viewing area, Gateway Plaza, Boat House Overlook and Boat House Beach and Peninsula area). Direct effects could occur to birds that nest in these habitats or use these habitats for foraging or cover. Birds are typically very mobile and this characteristic makes them less susceptible to actual physical harm during construction activities. Depending on the location of nests, species involved, and timing of project activities, some disruption of nesting activities may occur, but the overall impacts to bird species of concern would be short-term, direct, localized, minor, and adverse.

No population level impacts to special status species would occur under Alternative B. Alternative B *may affect but would not likely adversely affect* grizzly bear, Canada lynx, wolverine, greater sage-grouse, and yellow-billed cuckoo.

Cumulative Impacts

Special status wildlife species and their habitat in the Jenny Lake area have been substantially altered in the past by NPS development and the presence of people in this heavily visited area. These effects would continue. Other nearby developments, such as the park road and recently

constructed multi-use pathway system from the town of Jackson to South Jenny Lake, also could negatively affect wildlife, disturbing and altering the behavior of individual animals. Other recently implemented, in-progress, and foreseeable future projects with the potential to affect the same resources as the Jenny Lake Renewal Project include trail maintenance on the southwest portion of the Jenny Lake Trail, the Exum, West Cascade, and String Lake Bridge replacements, and the Moose Water and Wastewater Rehabilitation Project.

All of these actions would result in short- and long-term, localized and widespread, negligible to minor, adverse impacts to special status wildlife habitat and individuals. When the adverse effects of these other actions are added to the effects of Alternative B, there would be a short- and long-term, localized and widespread, negligible to minor, adverse, cumulative impact on special status wildlife. Alternative B would add a small increment to the overall adverse cumulative impact.

Wilderness

Affected Environment

Background

In 1972, Grand Teton National Park completed a wilderness study in accordance with the Wilderness Act that subsequently was transmitted to Congress (NPS 1972). In 1978, a bill was introduced recommending that Congress include approximately 143,454 acres of Grand Teton backcountry in the National Wilderness Preservation System. In that recommendation, approximately 122,604 acres of the park were identified as recommended wilderness and another 20,850 acres were identified as potential wilderness (NPS 1978). In August 2013, Grand Teton National Park staff determined approximately 21,500 acres, or 91 percent of the total of the John D. Rockefeller, Jr. Memorial Parkway acreage, which is administered by Grand Teton National Park, is eligible for wilderness designation.

Recommended wilderness refers to lands that are suitable for inclusion within the National Wilderness Preservation System, and thus are recommended for designation by the President to Congress. Potential wilderness is defined as lands that do not qualify for immediate designation due to temporary nonconforming or incompatible conditions (roads, power lines, etc.). These lands may become designated wilderness once the nonconforming or incompatible use has been removed or eliminated (NPS 2006c). Recommended wilderness within the park includes most of the Teton Range and several of the lakes at its base and the Two Ocean Lake area north of Moran. Potential wilderness within the park includes the open sagebrush flats between the Snake River and Teton Park Road, which is commonly referred to as “the Potholes,” and the Phelps Lake area near Moose-Wilson Road.

To date, Congress has not enacted legislation to include Grand Teton’s recommended wilderness in the National Wilderness Preservation System. However, NPS policy requires that the recommended and potential wilderness land in the park be managed as wilderness (so as not to preclude eventual designation) until such time as Congress either officially designates the land as wilderness or rejects the designation. This land, according to the Wilderness Act of 1964, must retain its primeval conditions and be managed to preserve its wilderness character. Therefore, the NPS manages this area to maintain its eligibility for future wilderness designation.

The NPS will take no action that would diminish the wilderness eligibility of an area possessing wilderness character until the legislative process of wilderness designation has been completed. Until that time, management decisions will be made in expectation of eventual wilderness

designation. All management decisions affecting wilderness resources will further apply the concept of "minimum requirement" for the administration of the area regardless of wilderness category.

Because they have the protection of both the NPS Organic Act and the Wilderness Act, wilderness areas within the National Park System are to be managed at the highest possible standard afforded by U.S. land conservation laws. Due to this extra protection, wilderness use decisions must be analyzed and framed differently than similar decisions for backcountry given the language and intent of the law. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and the influences originating outside of the wilderness boundaries (section 6.3.7, NPS 2006c). By policy, parks that have any category of wilderness lands have an affirmative responsibility to preserve wilderness values and must use a two-part minimum requirement analysis process to effectively analyze all proposed administrative actions that may affect wilderness character and values. This is integrated with, and supplemental to, NEPA, NHPA and other compliance requirements. This process is described in *Actions Common to All Alternatives*, in Chapter 2.

Regulatory

NPS wilderness management policies are based on provisions of the 1916 *NPS Organic Act*, the 1964 Wilderness Act, NPS policies and DOs, and legislation establishing individual units of the National Park System. Regulations and plans that are applicable to management of the recommended wilderness in the project area are listed below, including recent NPS direction, DO 41, Wilderness Stewardship, and "Keeping it Wild in the NPS" (NPS 2012b).

Wilderness Act of 1964 (P.L. 88-577)

The Wilderness Act of 1964 established a National Wilderness Preservation System to ensure that federally owned areas designated by Congress as wilderness shall be "administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness." Section 2(c) of the Wilderness Act defines wilderness as an area untrammeled by man; an area of undeveloped land that retains its primeval character and influence; an area protected and managed to preserve its natural conditions; and, which has outstanding opportunities for solitude or a primitive and unconfined type of recreation.

2006 NPS Management Policies

According to *NPS Management Policies 2006* (NPS 2006c), proposals having the potential to impact wilderness values must be evaluated in accordance with the Wilderness Act of 1964 (16 U.S.C. 1131) and the NPS procedures for implementing NEPA. The *NPS Management Policies 2006* states "the purpose of wilderness in the national parks includes the preservation of wilderness character and wilderness resources in an unimpaired condition and, in accordance with the Wilderness Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use." The *NPS Management Policies 2006* are supplemented by DO 41, Wilderness Stewardship, and Reference Manual 41.

Backcountry Management Plan For Grand Teton National Park

The Backcountry Management Plan for Grand Teton National Park (NPS 1990b) explains the policies and actions used at the park, for backcountry and wilderness management; identifies long-range management goals, intermediate objectives, and actions and options to meet those objectives; and is a working guide for employees who manage the backcountry. The

Backcountry Management Plan defines "backcountry" as any undeveloped area at least 250 yards from a road, including recommended and potential wilderness areas. The Backcountry Management Plan created five management zones for the park's backcountry. Management objectives for Zones I and V (NPS 1990b), which are present in the project area, are listed below.

The primary trails around Jenny Lake and to Hidden Falls and Inspiration Point are in Zone I. Other portions of the project area are considered to be Zone V. The management objective for Zone I is to provide large numbers of visitors the opportunity to experience a natural area close-up, without unacceptably changing the natural resources. Acceptable management actions include hardening trails, fencing to control visitor traffic, rehabilitation of disturbed areas, and other actions necessary to manage the effects of large numbers of people. The management objective for Zone V is to provide day users the opportunity to see the scenic vistas of the park with a minimum of visual intrusions. Zone V areas do not have maintained trails or camping.

Director's Order #41, Wilderness Stewardship (2013)

This DO supplements *NPS Management Policies 2006*, Chapter 6, Wilderness Preservation and Management. This DO was published to provide accountability, consistency, and continuity in the NPS wilderness stewardship program, and to guide service-wide efforts in meeting requirements of the Wilderness Act. This DO states that the qualities of wilderness character should be integrated into park planning and management in order to preserve the enduring benefits and values of wilderness for future generations. Wilderness character is not specifically defined in the 1964 Wilderness Act, nor is its meaning discussed in the act's legislative history. However, wilderness managers have identified four qualities of wilderness character based on the statutory language of the Wilderness Act (Landres et al. 2008): untrammeled; natural; undeveloped; and offering solitude or a primitive and unconfined type of recreation. These four qualities of wilderness character for the Grand Teton recommended wilderness area are summarized below.

Untrammeled Quality

Section 2(c) of the Wilderness Act states that wilderness is "hereby recognized as an area where the earth and its community of life are untrammeled by man." According to interagency wilderness strategy (Landres et. al. 2008), "Actions that intentionally manipulate or control ecological systems inside wilderness degrade the untrammeled quality of wilderness character, even though they may be taken to restore natural conditions or for other purposes." There is a low level of management activity within the wilderness lands in the project area; few management activities are taken or authorized by park staff to manage plants, animals, pathogens, soil, water, or fire in the wilderness that would impact ecological systems. Based on those measures, the untrammeled quality of wilderness lands in the project area is high.

Natural Quality

The Wilderness Act defines wilderness as an area "which is protected and managed so as to preserve its natural conditions" (Wilderness Act of 1964, section 2(c)). Natural conditions in the wilderness portion of the project area are adversely influenced by: trampling of vegetation and soil disturbance by visitors and horses along trails; creation of unmaintained trails by climbers and hikers; and introduction and invasion of exotic plant species, especially via horse manure along trails (NPS 1990b). Some wildlife species have likely been affected by the high number of visitors to this area. Habitat for wildlife species is fragmented by trails, and individual animals may avoid the area during the summer months due to the presence of humans. Minor changes in plant community composition associated with visitor use may have occurred from use along the

trails. In general, the natural quality of air, water, and soil resources remains high. There are areas of soil compaction, erosion along trails, and user-created trails, but overall these impacts are small and highly localized. In summary, there has been minimal influence on the natural quality of the wilderness overall; however, localized areas have been impacted to a greater degree.

Undeveloped Quality

The main evidence of humans in the project area includes trails and other forms of permanent structures such as bridges and route-finding signs, waterbars, checks, culverts, turnpikes, fences, bridge abutments, stairs, and steps. The park hardened the trails with gravel in the 1970s and built buck and rail fences to keep people on the trails. These installations and structures diminish the undeveloped quality of the wilderness. This quality is also diminished by frequent motorboats that deliver people to the wilderness boundary and other motorized noise that can be seen and heard from much of the project area. Overall, development is confined to the trails and key use areas and there has been a minor adverse impact to the undeveloped quality of the wilderness within the project area.

Opportunity to Experience Solitude or Primitive and Unconfined Recreation Quality

Primitive and Unconfined Recreation: This wilderness quality is measured by conditions that affect the *opportunity* for people who are visiting wilderness to experience primitive recreation and/or unconfined recreation. There are opportunities for primitive, unconfined recreation in Grand Teton's wilderness areas, including opportunities for hiking, backpacking, climbing, wildlife watching, and camping. These opportunities are more limited within the project area than in other locations in the wilderness. The current backcountry management strategy involves monitoring visitor use and the condition of resources, managing public use when necessary, and reviewing management policies and actions to ensure that they impose no more restrictions on visitors than are necessary to achieve defined management goals (NPS 1990b). Because of the high visitor numbers to this area, unconfined recreation cannot be allowed; visitors are asked to stay on trails through signs and fences and other barriers.

Hidden Falls and Inspiration Point are important destinations of the wilderness in Grand Teton National Park. For most people, going to Hidden Falls will be the only time they are in wilderness during their trip. It is an area where people experience an outstandingly scenic natural area away from their cars and bikes. The challenge for today's wilderness managers is to limit use to a level that the resource can sustain and that provides an appropriate degree of solitude while imposing as few limits as possible on users seeking to escape from controls. As the population increases, people seeking a recreational experience away from the developed world will put increased pressures on wilderness resources.

Solitude: Visitors have many opportunities for solitude in wilderness but during mid-day in the peak season most of these are outside of the project area. Largely because of a ferry across Jenny Lake that pre-dates the establishment of the park, Hidden Falls has always been the most popular backcountry area in the park. In 1970, when the park started its wilderness study, it was felt by management that Hidden Falls and the west shore of Jenny Lake did not provide opportunities for solitude, so they excluded the area from the preferred alternative. Public and other federal agency input demonstrated strong support for including the Hidden Falls area and therefore the wilderness boundary was moved to the lake shore. In 1972, this area was included in the President's recommendation to the Congress for areas of the park to be added to the National Wilderness Preservation System.

Accessed by foot, by horseback, and by motor and human-powered boat, Hidden Falls is the most sought after park destination because of its spectacular beauty, its flora and fauna, its easy access by boat, its promotion by advertisement and word of mouth, and the commercial climbing guide services available. Its geographical location as the gateway to the backcountry for both private and public interests makes this area a park management priority. In 2011, Grand Teton National Park staff performed a one-day visitor count in the Jenny Lake area. In total, 1,626 visitors (650 per hour) reached Hidden Falls and of those, 1,377 visitors continued on with 1,060 visitors reaching Inspiration Point (M. Wilson, personal communication). Past research has shown that of those who visit the falls, 31 percent go up Cascade Canyon beyond Inspiration Point.

The experience of solitude varies by individual and by expectation depending on the location and time of year. In general the number of groups encountered along a trail or route decreases an individual's feeling of solitude. As one moves farther into the backcountry, a higher number of visitor encounters disproportionately diminishes feelings of solitude. In addition to seeing and hearing other people, non-natural sounds in the area affect the visitor's opportunities for solitude. The close proximity to the airport, as well as sounds from park and other agency overflights interrupt the solitary experience even during low visitation. Boats on Jenny Lake can be heard during the peak season in most of the backcountry project area.

During the peak use season, moderate levels of noise are present due to visitors and concessioner boats. The high natural ambient sound level near the rushing Cascade Creek and roar of Hidden Falls offers temporary respite from non-natural sounds. Noise levels would be most noticeable primarily in popular use areas, such as from the boat dock to the Hidden Falls and Inspiration Point viewing areas. During the less busy spring and autumn seasons, natural sources of sound including wind, and birds, insects, and mammals, would be more prominent. During winter months, the natural soundscape of the area is dominated by wind and flowing water, birds, and mammals. Aircraft and distant road vehicles would still be audible but boat noise would not be present. Because of the relative absence of people during the winter, there would be fewer non-natural noises and greater opportunities for solitude.

Environmental Consequences

Impact Analysis Methods

In considering environmental impacts on wilderness, *NPS Management Policies 2006* require that the analysis take into account (1) wilderness characteristics and values, including the primeval character and influence of the wilderness; (2) the preservation of natural conditions (including the lack of human-caused noise); and (3) assurances that there will be outstanding opportunities for solitude, that the public will be provided with a primitive and unconfined type of recreational experience, and that wilderness will be preserved and used in an unimpaired condition (NPS 2006c, section 6.3.4.3).

Impacts to wilderness character were assessed by considering the four qualities of wilderness character (untrammeled, natural, undeveloped, and outstanding opportunities for solitude or primitive and unconfined recreation) for each of the alternatives.

Threshold	Definition
Negligible	Wilderness character would not be affected, or changes in qualities would be below or at the level of detection. A change in the wilderness character could occur, but it would be so small that it would not be of any measurable or perceptible consequence. Visitors would not likely be aware of the effects associated with the alternative.
Minor	Changes in wilderness character would be detectable, although the changes would be slight. A change in the wilderness character would occur, but it would be small and, if measurable, would be highly localized. Some visitors would be aware of the effects associated with the alternative, but the effects would be slight and not noticeable by most visitors
Moderate	Changes in wilderness character would be readily apparent to most visitors. A change in the wilderness character would occur. It would be measurable but localized. Visitors would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Changes in wilderness character would be readily apparent to all visitors, severely adverse or exceptionally beneficial. A noticeable change in the wilderness character would occur. It would be measurable and would have a substantial or permanent consequence. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.
Short-term	Short-term – Effects would primarily exist during active implementation of a management action, such as construction. Within a year after construction, effects would be mitigated effectively by the measures described in Chapter 2.
Long-term	Long-term – Effects would extend more than a year beyond implementation of a management action.

Alternative A (No Action Alternative)

Impact Analysis for Wilderness

Under the No Action alternative, existing management direction would continue as it has been since the wilderness recommendation. The untrammeled quality of wilderness character would remain the same; the management actions taken to intentionally manipulate or control ecological systems inside wilderness would undergo minimum requirement analyses and would remain low.

In this alternative, the natural quality of wilderness character would remain the same. Although the plant communities would remain largely in their natural state, there are large areas of soil compaction, erosion along trails, and user-created trails. These impacts would not be addressed in a comprehensive way and would largely remain and would likely increase. Large mammals would continue to avoid the area when a large number of visitors are present. These impacts from no action would continue to be long-term, indirect, localized, negligible to minor, and adverse to the natural quality of the wilderness.

The number of trails, bridges, and signs and other forms of development would remain the same under this alternative. The undeveloped character of the wilderness would be unchanged.

In this alternative, the outstanding opportunities for solitude would continue to be limited due to high visitor numbers and other non-natural sounds in the area. These conditions vary depending on the time of day and time of year, but there would be no change to the quality of solitude in wilderness under this alternative.

Hiking, backpacking, and wildlife watching are the main activities that occur in the wilderness portion of the project area. Due to the high number of visitors to this area, trail use and visitor management techniques have been employed; although the number of visitors has not been limited, visitors are confined to hiking on trails. This has likely had a long-term, localized, minor, adverse impact on the quality of primitive and unconfined recreation. Although there

would continue to be opportunities for visitors to experience primitive, unconfined recreation in other areas of the wilderness of Grand Teton, under Alternative A, the existing, somewhat restricted, opportunities for solitude and unconfined recreation within the project area would remain unchanged. The degradation of opportunities for solitude in wilderness would persist in the project area due to the continued presence of high numbers of visitors.

Cumulative Impacts

Past, current, and future actions contribute to adverse impacts on wilderness characteristics of the recommended wilderness portion of the project area. The natural and undeveloped qualities of the project area have been affected by: recreational uses; development and maintenance of park infrastructure including trails and facilities; resource monitoring and research activities; and changes in native plant communities. Activities inside and outside park boundaries, such as overflights, boat traffic, and vehicles in areas adjacent to wilderness, would continue to degrade wilderness character, with both sight and sound impacting the natural, undeveloped, and solitude qualities. Other recreational user groups, resource maintenance activities, or research projects within the wilderness could adversely impact wilderness character by affecting the opportunities for solitude and primitive recreation. This alternative when considered with other past, present, and reasonably foreseeable future actions, would result in long-term, indirect, localized, minor to moderate, adverse impacts to wilderness character and its qualities in the project area. The contribution to cumulative effects from this alternative would be relatively small.

Alternative B (NPS Preferred Alternative)

Impact Analysis for Wilderness

Under Alternative B, the number of management actions taken to intentionally manipulate or control ecological systems inside wilderness would remain low; therefore, the project would have no effect on the untrammeled quality of the project area. Staging of materials on site would adversely affect the natural quality of the project area during implementation and would have short-term, direct, localized, negligible to minor, adverse impacts on the natural character of the wilderness for several seasons. Once the project is complete, large areas of soil compaction, erosion along trails, and user-created trails would be rehabilitated. Therefore, post-project, Alternative B would have a long-term, direct, localized, minor, beneficial impact on the natural character of the wilderness.

Evidence of humans in the project area would continue due to trail work, including trail surface work, turnpikes and culverts, bridges, trail border stones, seating areas, and other features. The transportation of materials and workers in the area during construction, including temporary and intermittent use of helicopters and other motorized and mechanized tools would degrade the undeveloped quality. The elimination of some redundant and confusing trails, and elimination and restoration of user-created trails and other bare ground areas would partially offset this development in the long term. Overall, after the project is complete, effects to the undeveloped quality would be long-term, direct, localized, moderate, and adverse.

As visitation and opportunities for access have increased there has been a moderate diminishment of opportunities for the qualities of solitude and primitive and unconfined recreation within the project area. Under Alternative B, construction activities would diminish opportunities for solitude in the short term. Effects from construction would be short-term, direct, localized, moderate, and adverse. In the long term, there may be a slight increase in opportunities for solitude due to the one-way travel on the trails, thus resulting in fewer visitor encounters. Effects from one-way circulation would be long-term, indirect, localized, negligible

to minor, and beneficial. Hikers can continue to achieve a reasonable level of solitude by choosing the trail, time of day or year, or distance they hike, such as hiking beyond the Inspiration Point area where there are fewer people or hiking in spring, fall, or winter. Existing non-natural sounds, would continue to interrupt opportunities for solitary experiences even during low visitation periods.

Although there would continue to be opportunities for visitors to experience primitive and unconfined recreation in other areas of the backcountry, the encouraged one-way travel on the trails would impose new restrictions on hiking trails in the project area. Therefore, this alternative would have a long-term, direct, localized, minor, adverse impact on the primitive and unconfined recreation character of the wilderness.

Cumulative Impacts

Past, current, and future actions that contribute to adverse impacts on the wilderness character of the project area include: recreational uses; development and maintenance of park infrastructure including trails; and resource monitoring and research activities. Activities such as overflights, boat traffic, and vehicles in areas adjacent to wilderness negatively affect the undeveloped quality, and the high visitor numbers and noise from motorized vehicles degrade the opportunity for solitude or primitive and unconfined recreation quality of wilderness. This alternative when considered with other past, present, and reasonably foreseeable future actions, would result in long-term, direct, localized, minor to moderate, adverse impacts to wilderness character and its qualities in the project area.

Natural Soundscapes

Affected Environment

Background

The natural soundscape is the aggregate of all the natural sounds occurring in parks, absent human-caused sound, together with the physical capacity for transmitting these sounds. It includes all of the sounds of nature from biological or other physical resource components of parks (e.g., animal communication and sounds produced by physical processes such as wind in trees, thunder, and waves). Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials.

The natural soundscape is a component of any park setting. It is a resource having value for its presence and a value to be appreciated by visitors. *NPS Management Policies 2006* (NPS 2006c) and DO 47, Sound Preservation and Noise Management, (NPS 2000b) direct the NPS to preserve, to the greatest extent possible, the natural soundscapes of parks. The NPS is also directed to restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes.

Non-natural sounds, or noise generated by human activity, are superimposed on the natural soundscape. These sounds can adversely affect park resources by modifying or intruding upon the natural soundscape. It can also indirectly impact resources by interfering with sounds important for animal communication, navigation, mating, nurturing, predation, and foraging functions. Noise can also adversely impact park visitor experiences.

Existing Conditions

Natural ambient sound levels in Grand Teton National Park vary by location, season (e.g., biological activity is normally greater in spring and summer than winter, and the volume of water in waterfalls and rivers is lower in the fall and higher in the spring), and time of day. Sound levels are also influenced by the number of visitors, with sound levels during the busier summer months generally being higher than in winter. Changes are due primarily to increases in vehicle traffic on area roadways, boat traffic on water bodies, air traffic in the sky, and other visitor-related noise.

Jenny Lake Project Area Frontcountry Sounds and Acoustic Conditions

Natural: The sounds of birds, mammals, amphibians, and insects are present in the project area in spring and summer. Sounds from flowing water of rivers, waterfalls, and waves become more prominent, and rain and thunderstorms punctuate many afternoons. Natural ambient sound levels can be very low over much of the project area during periods of calm weather and away from running water. The bugling of elk and the rustling and falling of dry leaves from deciduous trees mark the end of summer and the beginning of autumn.

From late fall to late spring, during the period when the Jenny Lake frontcountry is closed to wheeled vehicles, the ambient soundscape is primarily influenced by natural sounds. During winter, chickadees and other small birds blend with the sounds of the larger ravens, Clark's nutcrackers, and magpies. Sounds associated with branches and trees rubbing against each other, and popping sounds from wood freezing and thawing during very cold periods, are commonly audible within the forested areas. Near Jenny Lake, the groaning and cracking of frozen lake waters may accompany temperature fluctuations. Flowing water from cascading creeks and waterfalls are audible at long distances despite the lower flow volumes because of the quieter background ambient sound levels.

Non-Natural (Human-made): During the busy summer season, visitor and administrative activities create non-natural sounds in developed areas, along roadways, and by aircraft overflights and boat traffic on Jenny Lake. Sounds from automobiles, trucks, motorcycles, and bus traffic on the Teton Park Road, the one-way loop (Jenny Lake Overlook), South Jenny Lake, and String Lake area occur throughout the day, but are more frequent during daylight hours. Sounds from road activity can be audible at distances greater than 2 miles, depending on the type of vehicle making the sound, ambient sound level, weather conditions, and surrounding topography. Human-made sounds, including portable music and voices, are often generated from parking lots and facilities. Park operations create noise intermittently from personnel, vehicles, generators, hand tools such as hammers and power saws, heavy equipment such as backhoes and tractors, and smaller power equipment such as chainsaws and weed eaters. On Jenny Lake, boat engines are audible from small personal watercraft. Although four-stroke engines are required for small boats, engine noise is still audible on and adjacent to the lake. Throughout the summer season, the concessioner boat motors and wave action on shorelines can be heard as they shuttle people between the east and west shore docks. Aircraft overflights also contribute to the non-natural soundscape, including general aviation aircraft travelling between points outside the park, administrative flights (both fixed wing and helicopters), high-flying commercial jet aircraft, and aircraft arriving and departing from the Jackson Hole Airport.

During the winter, aviation noise continues, although less frequently, and motorboat activity ceases. Park operations generate noise intermittently from personnel, vehicles, generators, and

snow plows, although these sounds are mostly confined to daylight hours and at a farther distance because the Teton Park Road is closed to most vehicular traffic.

Jenny Lake Project Area Backcountry Sounds and Acoustic Conditions

Natural: Natural sources of sound in the Jenny Lake backcountry include waterfalls, rushing water, wind, and wildlife. Running water from Hidden Falls and the various streams dominate the natural soundscape in the Hidden Falls/Inspiration Point area. Wind in the trees can contribute background sounds any time of the year. Occasionally, birds such as red-breasted nuthatch, ruffed grouse, and Clark's nutcrackers are audible. Chipmunks and red squirrels are slightly more common.

During the less busy spring and autumn seasons, natural sources including wind, birds, insects, and mammals are more prominent. During winter months, the natural soundscape of the area is dominated by wind and flowing water, birds, and mammals.

Non-natural (Human-made): During the peak summer season, non-natural sounds in the backcountry include hikers, climbers, boaters (motorized users, kayakers, and canoers), distant wheeled vehicles, and aircraft traffic. Human voices are regularly audible, sometimes at high levels.

Motorboat noise from the boat concessioner and rentals, and private boats are the primary noises heard from the lakeshore trails. Motorboats create noise not only during their passage across the lake, but also by the delayed wave action as their wake reaches the lakeshore. Waves reach the shore after the boat has reached its destination and can last for several minutes.

Airport-related aircraft noise from the nearby airport, as well as commercial and agency administrative overflights, contribute to noise that is audible throughout the project area.

From late-fall through late-spring, aircraft, distant road vehicles, and occasional voices from visitors are audible.

2012 Acoustic Data Collection

Acoustic data was collected from several locations of the Jenny Lake backcountry project area in August and September 2012. In most of the project area, the boats on Jenny Lake can be heard during the peak season. The data collection revealed motorboats were audible for 95 percent of a trip along the lakeshore trail from dock to dock. This combined with elevated sound levels from waves, resulted in very little time in the morning observations when boating was not audible. Noise levels are most noticeable primarily in popular use areas, such as from the boat dock to the Hidden Falls and Inspiration Point viewing areas. The lowest sound levels were along trails that deviated from the edge of the lake and were topographically shielded from the lake and from running water sounds. The high natural ambient sound level near Cascade Creek and Hidden Falls masks many distant, quieter non-natural sounds.

Data collected over 12 days between the hours of 7 a.m. and 7 p.m. in an area adjacent to the southwest Jenny Lake Trail near the Moose Pond overlook, found that non-natural sources were audible approximately 53 percent of the time. Watercraft were audible three percent of the time and aircraft were audible approximately seven percent of the time. Road vehicles were audible 20 percent of the time. People's voices were audible 36 percent of the time, and people walking were heard 13 percent of the time. Birds were heard 59 percent of the time.

Acoustic data collected over 12 days between the hours of 7 a.m. and 7 p.m. on the lower portion of the Horse Trail Bypass (just outside the project area) near the west boat dock, found that non-natural sources of sound were audible approximately 34 percent of the time. People's voices were heard approximately four percent of the time on this less busy trail. Watercraft were audible approximately 26 percent of the time and aircraft were audible approximately three percent of the time.

Environmental Consequences

Impact Analysis Methods

Impacts on natural soundscapes were considered for all parts of the Jenny Lake Renewal project. Impacts were evaluated using the process described in "Methods for Analyzing Impacts." Impact threshold definitions are as follows. For the Preferred Alternative, the mitigation measures in Chapter 2 would be implemented as part of the project.

Threshold	Definition
Negligible	Effects on the natural soundscape would be at or below the level of detection, and would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience or to biological resources. Changes would be short-term, slight and localized.
Minor	Effects on the natural soundscape would be localized and short term and would be small, and of little consequence to the overall visitor experience or to biological resources. The change would be noticeable but would not negatively affect the acoustic character of the site. Changes to the natural soundscape would be short-term and localized.
Moderate	Effects on the natural soundscape would be readily detectable, localized, and short term or long term. Effects would noticeably change the acoustic environment of the immediate site and the character of the overall setting. Natural sounds would prevail, but activity noise would be present at low to high levels and duration. Changes to the natural soundscape would be short or long-term and obvious.
Major	Effects on the natural soundscape would be obvious and long term, and would have substantial consequences to the visitor experience or to biological resources in the region. The action would create obvious changes in the acoustic character and overall impression of the area. Changes to the natural soundscape would be significant. Changes would be long-term, considerable, and widespread, with adverse changes considered obtrusive.
Short-term	Effects would occur only during and shortly after a specified action or treatment.
Long-term	Effects would persist well beyond the duration of a specified action or treatment, or would not be associated with a particular activity such as construction. Long-term effects also include events of short duration, such as the sound from an aircraft taking off or landing, that occur regularly, such as daily, over an extended period of time.

Methodology and Assumptions

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

Sound levels generated by construction activities affect recreational users differently, depending on each visitor's activities and expectations. The time of day or time of year influences the impact a given noise will have.

Duration and frequency of occurrence of a noise affects the impact the noise will produce. For example, in popular use areas where the general noise produced by other sources such as generators, automobile engines, and radios are almost constant from dawn to dusk, noises from construction equipment could be less noticeable. In lightly used areas in the backcountry, the intermittent sound from motorized equipment would have a greater effect than the same action in a popular use area. These factors were addressed qualitatively in the impact analysis.

Alternative A (No Action Alternative)

Impact Analysis for Natural Soundscape

Under Alternative A, no additional administrative/construction-related impacts would occur within the Jenny Lake project area. Alternative A would not generate any new short-term sources of noise that are associated with construction. Effects would continue to be short term, direct, localized, minor, and adverse.

Jenny Lake Project Area Frontcountry

In the frontcountry, existing vehicle, equipment, and human noise throughout South Jenny Lake, String Lake, the one-way loop, and to a lesser extent, human noise along trails at the lake, would continue to contribute a relatively high amount of ambient noise to the soundscape. Vehicle engines, brakes, horns, and doors would continue to create noise in parking lots and access roads. The high number of visitors at South Jenny Lake using the trails and facilities would continue to affect ambient soundscapes. Sounds generated by visitors would continue to include human voices, personal electronics, and other devices. Motorboat activity on the lake would remain the same. Aircraft would continue to be flying above the project area at current levels.

Jenny Lake Project Area Backcountry

In the backcountry, most of the noise sources described above for the frontcountry would be present, but at a much lower sound level. There would be no additional noise impact or changes to the current natural soundscape of the project area.

In the future, as trails and bridges age and fail within the project area, materials would be needed to repair, rebuild, and maintain the structures. These maintenance activities would impact the natural soundscape.

Cumulative Impacts

Past, current, and future actions that contribute to adverse impacts on the natural soundscapes include: recreational uses; maintenance of park infrastructure including trails and bridges, road construction, and construction of the multi-use pathway system; resource monitoring and research activities; overflights, boat traffic, and vehicles in adjacent areas. Alternative A would not result in any new construction activities or changes in existing use or maintenance; therefore, when added to other past, present, and reasonably foreseeable future actions in Grand Teton National Park, including existing human-made noise in the project area, Alternative A would continue to result in minor, long-term, adverse impacts to natural soundscapes.

Alternative B (NPS Preferred Alternative)
Impact Analysis for Natural Soundscape

Project-related impacts to natural sounds from implementation of Alternative B would be from noise associated with the construction/rehabilitation of facilities, infrastructure, and trails. There would be no long-term changes to the natural soundscape after construction. Noise from construction activity varies with the types of equipment used and the duration of use. Examples of construction noise include helicopter transport of materials, operation of heavy equipment, voices of construction workers, and noise associated with material hauling vehicles. These activities would degrade the natural soundscape in the affected areas and the noise could affect nearby recreational users on trails, overlooks, trailheads, and other areas. Effects would be short term, direct, localized, minor to moderate, and adverse.

Jenny Lake Project Area Frontcountry

In the frontcountry, noise from construction activity at South Jenny Lake would vary with the types of equipment used and the duration of use. The use of heavy equipment would commonly occur intermittently throughout daytime hours. Generally, heavy equipment would generate the highest noise levels throughout the construction phase, but the impacts would be temporary in nature, and would attenuate with distance. The types of equipment used for site preparation would be graders, pavers, dump trucks, and concrete mixers.

Jenny Lake Project Area Backcountry

In the backcountry, a medium size helicopter would be used for any delivery of supplies and materials too heavy to be transported by pack or stock, such as stone, gravel, and steel and wood beams for bridge reconstruction. Recent estimates of quantities of material requiring transport to backcountry staging areas indicate it would take approximately two weeks of helicopter flights a year, with up to 40 round-trips per day. Helicopter operations would take place one week in April and one week in October during low visitation periods, for three or four years. Areas within ½ mile of the helicopter activity would experience relatively loud sounds and comparatively high percent-time audible during the period of helicopter support operations, while more distant areas would experience aircraft sound for less time and at lower sound levels. Delivery of material by helicopter would have a moderate, short-term, adverse effect on park soundscapes in and adjacent to the flight paths to the project sites, and in the project area as a whole, during helicopter, takeoff, flight, and landing.

Other construction-related activity would cause minor to moderate, short-term, adverse impacts to the natural soundscape. Work crews would be present at the project site during the construction period, approximately 15 to 20 weeks per season. At least four crews, comprised of up to five individuals per crew, would be working 10-hour work days intermittently throughout the duration of the project. There would be intermittent use of power tools when they are determined to be the minimum tool necessary to complete the project work. Mechanized tools may include: power tools, gas or electric rock drills, and mechanized wheelbarrows, as well as infrequent use of generators and/or compressors. Several hours of chainsaw use is likely to occur throughout project implementation. Based on the current design, it is estimated that these power tools may be heard for a period of about four weeks total. In addition to motorized and mechanical noises, the voices of construction crews could be heard by those in the vicinity throughout the project. After construction there would be no changes or additional impacts to the natural soundscape. Overall, natural sounds would continue to prevail in the majority of the

backcountry and this alternative would result in short-term, minor to moderate, adverse effects on the natural soundscape.

Cumulative Impacts

Actions with the potential to impact natural soundscapes in the vicinity of Jenny Lake are the same as those described for the No Action alternative. This project would add noise to the natural soundscape in a portion of the parks' frontcountry and backcountry during project work, in the form of helicopter operations, heavy equipment, mechanized and motorized equipment and tools, human voices, and other sounds. Motorboat operations on Jenny Lake along with nearby wheeled vehicle activity would continue to contribute the predominant impact to the natural soundscape of the project area. Other non-natural noise would occur as a result of park operations, park visitors, and non-park related sounds such as aircraft overflights. This project would add noise in the short term, but in the long term would result in no additional impacts to the natural soundscape. When added to other past, present, and reasonably foreseeable future actions in the park, Alternative B would have short-term, direct, localized, minor to moderate, adverse impacts.

Visitor Experience

Affected Environment

In the park's Foundation for Planning and Management (NPS 2006a), the NPS identified visitor access to outstanding experiences in an outstanding natural environment as a fundamental resource with the following values and desired conditions:

Fundamental Resource/Value:

- Spectacular scenery and quality natural environment;
- Opportunities to observe wildlife;
- Full spectrum of access, ability level, activities, season; and
- Wilderness character, opportunities for solitude, natural lightscapes, natural soundscapes.

Desired Conditions (general law and policy guidance):

- Visitors of all ages and physical abilities have opportunities to understand, appreciate, and enjoy the wonders of Grand Teton and John D. Rockefeller, Jr. Memorial Parkway in many different ways and seasons in a manner that does not diminish the fundamental resources and values of the park. Visitors forge their own emotional and intellectual connections with the meaning and significance inherent in the park and its resources and its vital role in the national park system.
- Visitors are informed about the range of outdoor and educational opportunities as well as ways to stay safe.
- Opportunities to find solitude and experience natural sounds and dark night skies are maintained.
- Visitor activities will be supported by appropriate facilities that are safe, fit with the natural environment and cultural resources, and are sustainable.
- Visitor activities will also be supported by commercial services that are necessary and appropriate for public enjoyment and are consistent with park purposes.

Jenny Lake Project Area

The 2008 Visitor Survey Project determined that Jenny Lake is the most popular area to visit in the park with 70 percent of the 2.7 million visitors stopping by Jenny Lake area during their trip to the park. There are visitor services, as well as access to numerous trails with hikes ranging from easy to strenuous, and from the valley floor to the alpine environment located in the recommended wilderness. A paved, multi-use pathway departs from South Jenny Lake and travels south to Moose and continues to the town of Jackson. Bus/tour groups provide access to Jenny Lake for a wide range of people, including foreign visitors, college field trips, specialty tours, and seniors. The recreational experiences of visitors, whether they are sightseeing, biking, taking photographs, hiking, canoeing or engaging in other pursuits, is enhanced by the grandeur of the Teton Range rising above Jenny Lake.

Frontcountry

The South Jenny Lake developed area includes a campground, ranger station, general store, visitor center, restrooms, and climbing and boating concessioner facilities. There is no clear entrance at South Jenny Lake, creating a visitor experience that does not welcome and orient visitors. In the visitor services area, there are few route-finding and trip planning tools, and visitors become disoriented and confused trying to find the lake or other key points of interest. The lack of orientation and route-finding signs has resulted in the creation of user-created trails. Current interpretive displays do not communicate key interpretive messages and have limited interpretation of the rich history of the Jenny Lake area or the recommended wilderness it provides access to.

In May 2009, Grand Teton National Park opened a multi-use pathway from Dornan's to South Jenny Lake. A pedestrian counter just north of the Taggart Lake Trailhead recorded more than 25,000 pathway recreationists in both 2010 and 2011. Assuming most riders are on out-and-back outings, this equates to more than 12,500 users each summer season. In 2012, a 12.5-mile stretch that connects Jackson to Moose was opened completing over 20 miles of multi-use, public pathways now extending from the town of Jackson to South Jenny Lake.

The String Lake Outlet is located at the north end of Jenny Lake. The String Lake Trailhead is 1.5 miles west of the North Jenny Lake Junction. This trailhead provides access to Jenny Lake and String Lake, Cascade and Paintbrush Canyons, Hidden Falls, and Inspiration Point.

The Jenny Lake Overlook, located on the scenic 4-mile, one-way loop, has been a popular destination for hikers and automobile enthusiasts for over 90 years. Located on a terminal moraine, the overlook provides views of Jenny Lake, Cascade Canyon, Mount Teewinot, Mount Moran, and Mount St. John. Visitors can park their car at the overlook and access the paved path (currently closed) that leads to the shoreline and the 6.6-mile long trail that winds around the entire lake.

Throughout the project area most parking lots, wayside exhibits, and overlooks have curb cuts and accessible designated parking that are fully ABAAS compliant. In addition, the multi-use pathway from South Jenny Lake to the town of Jackson is ABAAS compliant. In the South Jenny Lake visitor services area, there are 0.33 miles of trails accessible for persons with disabilities with asphalt surfaces and appropriate grades (in addition to the walkways leading from the parking lots that are ABAAS compliant). However, in many areas these compliant areas are isolated because the approach is non-accessible. For example, while the concessioner boat dock is accessible, the trail from the visitor services area to the boat dock is an 8.5 percent grade

(which is too steep) and the Lake Walk Trail along the east side of the lake has segments that have 18 percent grades. Therefore, there are no meaningful ABAAS compliant routes to the lake's edge. Due to the age and design of the buildings in South Jenny Lake, several are in need of retrofitting to make them ABAAS compliant as well. The Jenny Lake Campground currently has only one, non-compliant restroom servicing the 50-site campground and none of the campsites are ABAAS compliant.

The Jenny Lake area water and wastewater infrastructure services the campground, a ranger station, visitor center, store, public restroom, trailhead, and two concessioner facilities. The water and wastewater systems were originally installed in the 1940s and have been heavily modified to accommodate relocation of buildings in the area, and are undersized to meet future demands for potable water, water for fighting structural fires, and sewage treatment.

Backcountry

Over 50 percent of visitors to South Jenny Lake will make their way to the backcountry, either by hiking or via a concessioner-operated boat. The Jenny Lake Boat tour brings over 100,000 visitors from South Jenny Lake to the west boat dock each year. The West Boat Dock is the only developed area on the west side of the lake before hikers move into the recommended wilderness area (Refer to *Wilderness* section for more information).

From the West Boat Dock, visitors are encouraged to explore Hidden Falls, Inspiration Point, and Cascade Canyon. The Jenny Lake loop trail that passes through this area has been in existence since the 1930s. It is a 5.2-mile roundtrip hike to Hidden Falls and a 6.0-mile roundtrip hike to Inspiration Point from the visitor center by way of the Jenny Lake Trail, or a 1-mile and 2-mile hike, respectively, from the west boat dock for those using the concessioner shuttle boat.

Grand Teton National Park staff performed an informal visitor count in the Jenny Lake area on August 10, 2011 from 10 a.m. to 3 p.m. That date and time were chosen because they represent the historically busiest time of year at Jenny Lake. The purpose of the assessment was to better understand visitor use at the South Jenny Lake, Hidden Falls, and Inspiration Point areas, including the percentage of those visitors hiking around the lake versus those utilizing the concessioner boat shuttle. The results of the survey are as follows: A total of 3,050 visitors entered the South Jenny Lake area during the five hour study period. Of that total, 1,122 visitors (37 percent) took the boat across Jenny Lake and 569 visitors (19 percent) hiked the southwest portion of the Jenny Lake Trail towards Hidden Falls. In total, 1,626 visitors (53 percent) reached Hidden Falls and of those, 1,377 visitors (45 percent) continued on with 1,060 visitors (35 percent) reaching Inspiration Point.

Environmental Consequences

Impact Analysis Methods

NPS Management Policies 2006 (NPS 2006c) state that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy parks. Past interpretive and administrative planning documents provided background on changes to visitor use and experience over time. Anticipated impacts on visitor use and experience were analyzed using information from previous studies and included park staff knowledge of the resources and site; visitor surveys; review of existing literature and park studies; information provided by NPS professionals; and professional judgment. The following impact intensity levels were developed to analyze visitor experience:

Threshold	Definition
Negligible	Visitor use and experience would not be affected, or the effects on visitor use and experience and recreation would not affect more than a few visitors.
Minor	Effects on visitor use and experience and recreation would be detectable.
Moderate	Changes in visitor use and experience and recreation would be readily apparent and measurable, and would affect many visitors.
Major	Changes in visitor use and experience and recreation would be sufficiently large to be readily apparent and would affect most visitors.
Short-term	Effects would occur only during and shortly after construction or treatment measure.
Long-term	Effects would persist well beyond the duration of the construction or treatment measure, or would not be associated with a particular action such as construction or an accidental failure of water or wastewater.

Alternative A (No Action Alternative)

Impact Analysis for Visitor Experience

Under the No Action alternative, existing facilities and policies would remain in place. No substantial changes would occur to the Jenny Lake area in the frontcountry and backcountry, aside from normal trail and facility maintenance.

Frontcountry

Under this alternative there would continue to be only a few areas that provide access for a broad range of visitors. Interpretation would be limited to the existing information in the Jenny Lake Visitor Center, with slightly improved messaging regarding Jenny Lake history, features, and other information due to the new Jenny Lake Interpretative Master Plan. Important visitor resource and safety information would be limited. Visitor route-finding and orientation would continue to cause confusion because of the lack of one clear entrance and appropriate signs, along with a confusing trail system. Trails, restrooms, overlooks, and other infrastructure would continue to degrade due to the large numbers of visitors every year. No action would be taken to address the limited access to the lake that results in visitors venturing off trail and causing erosion, compacted and denuded soils, and degradation of natural resources. There would continue to be a lack of amenities, such as benches and other seating, picnic tables, and shade. Without any modification or upgrades to the outdated water or wastewater systems, visitor experience would potentially be affected by unpredictable disruptions in service or periodic failures. With limited structural firefighting capability, the facilities in the Jenny Lake area, including historic structures, could be threatened. Effects would be long-term, indirect, localized, minor, and adverse.

Backcountry

Because of a lack of information and interpretation, few visitors to the backcountry likely realize they are in wilderness. Under this alternative, information would continue to be lacking about the importance and management implications of wilderness. The configuration of the west boat dock would not be addressed; inadequacies related to the lack of shelter, seating, and staging space would remain. In addition, nothing would be done to address the lack of route-finding and orientation for visitors leaving the boat dock wanting to hike to Hidden Falls and beyond. Hidden Falls and Inspiration Point and their associated trails would remain congested and heavily impacted. Both viewing areas would continue to be impacted due to high visitor numbers. Snowmelt and associated run-off coupled with the concentration of visitors would continue to cause trenching and erosion, exposing rocks and tree roots. Seasonally muddy conditions could

cause widening of trails as visitors walk outside the trail tread to avoid wet areas. Bridges would require frequent repair or replacement due to their design and/or location. No action would be taken to address inadequate route-finding throughout the area, and visitor confusion related to confusing trails would continue. Effects would be long-term, indirect, localized, minor, and adverse.

Cumulative Impacts

Past, current, and future actions contribute to beneficial and adverse impacts on visitor experience. Projects with the potential to impact visitor experience in the vicinity of Jenny Lake include road construction and construction of the multi-use pathway system from the town of Jackson to South Jenny Lake; the Jenny Lake Interpretive Master Plan; trail maintenance on the southwest portion of the Jenny Lake Trail; replacement of the West Cascade, String Lake, and Exum Bridges; and rehabilitation of the Moose water and wastewater system. Additional potential impacts could come from recreational uses; development and maintenance of park infrastructure including visitor centers, roads, trails, pathways, and facilities; resource monitoring and research activities; and activities inside and outside park boundaries, such as overflights, boat traffic, and vehicles in and adjacent to the project area. In the short- term, the impacts of construction of other projects, in combination with existing conditions in the Jenny Lake area, would be direct, widespread, moderate, and adverse. Long-term effects would be indirect, localized, minor, and beneficial. The impacts of this alternative, in combination with impacts on visitor experience from other past, present, and reasonably foreseeable future actions, would continue to result in a long-term, direct and indirect, localized, minor to moderate, adverse cumulative impact.

Alternative B (NPS Preferred Alternative)

Impact Analysis for Visitor Experience

Under Alternative B, improvements would be made to many aspects of the visitor experience in both the frontcountry and backcountry, including improvements in orientation, interpretation, and facilities, such as the Hidden Falls and Inspiration Point trails, South Jenny Lake area improvements, Jenny Lake Overlook, and String Lake Outlet area. Implementation of the 2013 Jenny Lake Interpretive Master Plan would improve the overall visitor experience by focusing on people, place and preservation, as well wilderness and safety information. The plan's vision is to welcome and orient visitors of all abilities by providing interpretation in multiple formats.

In the short term, direct, localized, moderate, adverse effects would occur during construction as visitors would be affected by noise, the presence of equipment, and restricted access in certain areas. In the long term, the project efforts would result in direct and indirect, localized, moderate, beneficial impacts to visitor experience because of the planned improvements.

Frontcountry

Construction activity would affect visitor experience during project implementation; the intensity and nature of these activities in the frontcountry would vary over the construction period as would the effects on visitor experience. Construction activities would generate varying numbers of vehicle trips (depending on the type of work) to accommodate construction workers, trucks, and equipment. Less intensive construction efforts at the project site (e.g., revegetation and restoration efforts) would require fewer workers and few truck trips, and would have short-term, direct, localized, minor, adverse impacts to traffic flow and traffic safety conditions. Mitigation measures (e.g., implementation of a traffic control plan, with advance warning signs, and flaggers to

direct traffic) would be employed to reduce transportation effects (though the measures would not change the magnitude of the adverse effects). Therefore, the effect of construction activities would be minor, but varying in intensity depending on the construction activity and the traffic volumes on area roads used by construction-related vehicles.

Once the project is complete, the visitor's sense of arrival would be improved by creating one primary gateway to the newly renovated interpretive plaza. The redesigned drop-off area would be clearly delineated and expanded to provide safe staging for large and small vehicles, as well as providing room for the future increase of transit efforts. Visitor experience would be enhanced by the addition of interpretive, informational, and route-finding elements in the frontcountry.

Trails within the South Jenny Lake area would be ABAAS compliant. Visitors would be oriented to Jenny Lake with a series of unique overlooks and access points at the lake edge, including one providing ABAAS compliant access to the beach. When possible, unnecessary fencing and other made-made features would be relocated or eliminated to improve scenic quality. Construction of a separated access and queuing boardwalk to the east boat dock would improve the visitor experience by separating boat queuing from bridge and trail hikers.

Visitor education and communication about the availability of parking at the Jenny Lake area, as well as parking space redesign or management, would make parking more efficient.

Correcting the deficiencies of the South Jenny Lake water system would protect visitor experience by ensuring delivery of clean potable water and ensuring adequate supplies for fire suppression needs. Upgrades to the South Jenny Lake wastewater system would ensure sufficient facilities are available for visitors. Additional ABAAS compliant restroom facilities would help accommodate the large numbers of visitors during the peak season, reducing wait times and crowding in the Jenny Lake Visitor Plaza, as well as improving accessibility at the Jenny Lake Campground.

Visitors of all abilities would once again be able to enjoy the Jenny Lake Overlook and its connected trails to the water, as they would be reconstructed to be ABAAS compliant and reminiscent of CCC construction. Improvements in the Jenny Lake Campground would make that area more accessible as well.

Backcountry

Construction activity would affect visitor experience during project implementation; the intensity and nature of these activities in the backcountry would vary over the construction period as would the effects on visitor experience. Visitor experience would be affected by transportation of materials and equipment, but sounds generated from aircraft related to this project would be temporary, lasting only as long as the flights, causing short-term, direct, localized, moderate, adverse impacts on visitors and employees. Less intensive construction efforts at the project site (e.g., trail work, revegetation and restoration efforts) would require fewer workers and would only affect those visiting the local area.

Encouraging one-way, clockwise travel from the West Boat Dock to trails in the backcountry would improve the visitor experience. Because the new circulation would be a complete, intuitive, self-guiding loop system, it would potentially reduce crowding. The size of the boat dock would be increased to accommodate a queuing area, as well as provide a seating area for visitors unable to hike the trail or waiting for others.

The new Dock Bypass/Stock Trail would enhance visitor experience by separating stock and/or through hikers from hikers queuing for the boat. This would also provide a short loop hike to the Cascade Creek Bridge and back to the boat dock, potentially resulting in less crowding in some areas. Because the new Cascade Creek Bridge would overlook a deep cascade-filled canyon it could become a destination in itself, providing a new experience for visitors. Eliminating the need for Confusion Junction would enhance visitor experience by reducing human and horse conflicts, reducing confusion about what trail to follow, and improving resource conditions in this impacted area.

Congestion in the Hidden Falls Overlook area would be addressed by adding a new spur trail that would allow visitors to enter the area from the slope behind and encourage one way circulation through the area. Hikers would experience a more dramatic sense of arrival as they descend from the trail into the viewing area.

The two bridges between Hidden Falls and Inspiration Point would be replaced and the trail up to Inspiration Point would be repaired to address erosion-caused gullies, improve trail conditions, and prevent future erosion. Despite the obstacles present on the trail to Inspiration Point, leaving this section of trail mostly in its present state would continue to provide a challenge to visitors and highlight the wilderness character of the area. At Inspiration Point, trails would be better defined and directional signs would be added to eliminate confusion and reduce resource damage.

Repairs are proposed along a section of trail located on the south side of Cascade Creek approaching the West Cascade Bridge. The North Cascade Creek Trail reroute complements the one-way traffic and facilitates the elimination of Confusion Junction. These actions would enhance visitor safety and experience in the long term.

Cumulative Effects

Past, current, and future actions contribute to beneficial and adverse impacts on visitor experience. Projects with the potential to impact visitor experience in the vicinity of Jenny Lake include road construction and construction of the multi-use pathway system from the town of Jackson to South Jenny Lake; the Jenny Lake Interpretive Master Plan; the adaptive management and education regarding restrooms in the backcountry; trail maintenance on the southwest portion of the Jenny Lake Trail; replacement of the West Cascade, String Lake, and Exum Bridges; and rehabilitation of the Moose water and wastewater system. Additional potential impacts could come from recreational uses other than hiking; development and maintenance of park infrastructure including visitor centers, roads, trails, pathways, and facilities; resource monitoring and research activities; and activities inside and outside park boundaries, such as overflights, boat traffic, and vehicles in and adjacent to the project area. This alternative when combined with other past, present and reasonably foreseeable future impacts would result in short-term, direct, localized and widespread, minor to moderate, adverse impacts, and long-term, localized and widespread, minor to moderate, beneficial cumulative impacts to visitor experience.

Park Operations

Affected Environment

Background

Park operations refer to the adequacy of staffing levels and the quality and effectiveness of the park infrastructure in protecting and preserving vital resources and providing for an enjoyable

visitor experience. Infrastructure facilities include the roads that are used to provide access to and within the park (both administrative and visitor use), housing for staff required to work and live in the park, visitor orientation facilities (including visitor centers, developed and interpreted sites, visitor center bookstores, and other interpretive features), administrative buildings (office and workspace for park staff), management support facilities (garages, shops, storage buildings, and yards used to house and store maintenance equipment, tools, and materials), and utilities such as phones, sewer, water, and electricity. In addition to park resources in the Jenny Lake area, three concessioners operate out of South Jenny Lake providing visitor services and amenities.

The planning and scheduling of resources, routine operation, and maintenance activities for facilities in the Jenny Lake area, including the water and wastewater facilities, are performed in accordance with established schedules and are integrated with operations at other sites in the park. While staffing levels are currently adequate to maintain operations, there is little or no surplus to meet needs beyond the normally planned and scheduled activities. Implementation of a new project, as well as responding to emergencies, can affect the operations of a park such as the number of employees needed; the type of duties that need to be conducted; when/who would conduct these duties; how activities should be conducted; and administrative procedures.

NPS facilities in the project area include the Jenny Lake Ranger Station, Crandall Studio/Jenny Lake Visitor Center, campground, store, multi-use pathway, and restrooms. Concession-operated facilities in the project area include Jenny Lake Boating, Exum Mountain Guides, and Grand Teton Lodge Company.

Environmental Consequences

Impact Analysis Methods

Virtually every action or proposal that is evaluated in this NEPA process has either a direct or indirect effect on park operations. *NPS Management Policies 2006* states: The National Park Service will provide visitor and administrative facilities that are necessary, appropriate, and consistent with the conservation of park resources and values. Facilities will be harmonious with park resources, compatible with natural processes, aesthetically pleasing, function, and energy and water efficient, cost effective, universally designed, and as welcoming as possible to all segments of the population. NPS facilities and operation will demonstrate environmental leadership by incorporating sustainable practices to the maximum extent practicable in planning, design, siting, construction, and maintenance. There are also a number of DOs that pertain to park operations. The impact intensities for park operations are as follows:

Threshold	Definition
Negligible	Impacts would not occur or would not be detectable.
Minor	Impacts would be slight, short-term and localized, but would not have a measurable effect to park operations.
Moderate	Impacts would be measurable, potentially long- term, and would measurably improve or degrade park operations.
Major	Impacts would be long-term, and significantly improve or degrade park operations.
Short-term	Impact has a duration less than or equal to the period of construction.
Long-term	Impact has a duration greater than the period of construction.

Alternative A (No Action Alternative)

Impact Analysis for Park Operations

Alternative A would result in no changes in existing conditions of park operations and facilities in the Jenny Lake area other than those identified in the *Actions Common to All Alternatives* section, which includes implementation of the Jenny Lake Interpretive Master Plan. Overall, effects to park operations from the No Action would be long-term, indirect, localized, minor to moderate, and adverse.

The No Action alternative would most likely impact future park operations due to the condition of the current water and wastewater systems. The age of the water and wastewater systems would result in continuously increasing maintenance because of a lack of replacement of or substantial improvements to the existing infrastructure. Maintenance staff would experience an increasing need to respond to emergency actions resulting from aging and deteriorating infrastructure. Water and wastewater system operators would continue to be challenged with repairing and rehabilitating an already degraded and deteriorated water system. Operational and maintenance costs would increase as the system further ages and deteriorates. Emergency responses to system failures would continue to disrupt the scheduling of park labor sources as response personnel were drawn from their regular activities. Operations at the Jenny Lake facilities are integrated with operations at other sites throughout the park. While staffing levels are adequate to maintain operations, there is little or no surplus to meet needs beyond the normally planned and scheduled activities.

The septic systems in the South Jenny Lake visitor services area would continue to be undersized by WYDEQ and EPA criteria by at least 43 percent of that required for the number of visitors in the area during the peak season. This situation results in the septic tank being pumped an average of three times per summer. The pumped sewage and sludge is highly concentrated and often overloads the treatment processes in park lagoons where it is dumped. Failure of wastewater systems, including wastewater mains, would increase the possibility of public exposure to unsanitary conditions and possible temporary or even long-term closure of facilities. In addition, the loss of either system for more than a few hours would require alternative strategies for managing human waste, such as closing restrooms to visitors and installing portable toilets for park staff.

Under the No Action alternative, the park would not be fully achieving conservation-related goals or sustainability efforts to reduce water usage and to be more energy efficient. Water loss from leaks caused by breaks in the deteriorating water lines and energy expended on maintaining inappropriate pressure in the existing water system would persist. Costs associated with the No Action alternative also potentially include penalties for violating State of Wyoming drinking water standards, greater maintenance and operation costs, costs associated with visitor dissatisfaction due to water issues, and potential loss of property due to inadequate fire suppression capabilities. In addition, the health and safety of employees that serve on the structural fire brigades could be at risk if the water system cannot fully support fire suppression capabilities.

In the backcountry, the condition of the trails would continue to need emergency fixes due to drainage problems and other issues caused by poor trail conditions. Continued degradation of backcountry trails and bridges could lead to trail closures due to unsafe retaining walls, tread features, and creek crossings.

Cumulative Impacts

When added to other past, present, and reasonably foreseeable future actions in Grand Teton National Park, Alternative A would continue to put a strain on park operations. Maintenance and repairs to existing utilities, facilities, roads, trails, and other park and concessioner operated infrastructure is ongoing, because other facilities are also outdated and in need of rehabilitation (e.g., wastewater systems). A major source of impacts to the operations and facilities is the continued use of this site in its existing condition by visitors and staff. The water and wastewater systems are in continual need of repair, mainly due to the age of the utility systems. Past activities considered in this analysis include park operations for interpretation, maintenance, administration, visitor protection, and resource management. Impacts to park operations, including all associated needs for employing staff to conduct these actions (administrative, housing, vehicles, etc.), would continue. Additional burdens on park operations typically include fire management actions (e.g., prescribed and wildland fires), human use, emergency services, increased resource monitoring, and construction projects. Effects from these other actions are short- and long-term, localized and widespread, minor to moderate, and adverse. When added to other past, present, and reasonably foreseeable future actions in the park, Alternative A would have short-and long-term, indirect, localized and widespread, minor to moderate, adverse impacts.

Alternative B (NPS Preferred Alternative)

Impact Analysis for Park Operations

Implementation of Alternative B would affect park operations in the short term during the construction phase. Park personnel would be required to coordinate, plan, permit, and oversee all decisions associated with project design; respond to any public needs and mitigations associated with the project implementation; oversee construction of the project; and in some cases, implement construction. Since this requirement would be limited to the time-frame of the project and such a project falls under the normal duties of park staff, the impact to park management as a whole would be expected to be short-term, direct, localized, minor to moderate, and adverse.

Temporary inconveniences to park and concessioner operations would occur during construction activities. Project activities could result in closures or interruption of services and may require that the water is temporarily shut-off until the specific project activity is completed. During construction, lane closures and traffic delays could occur, resulting in short-term, direct, localized, minor, adverse effects to on- and off-duty park and concessioner employees traveling on the roads during this time.

The replacement of the water and wastewater systems in the Jenny Lake area would have long-term, localized, moderate, beneficial effects to park operations. The water and wastewater systems would be designed to address current system failings with regard to ensuring adequate present and future capacities for potable water and wastewater management. The system would be designed to conform to all current standards plus any regulations that can foreseeably be promulgated, such as more stringent wastewater treatment. The siting and configuration of facilities would accommodate later expansion as justified by increasing demand. The health and safety of park personnel working on the water system and of fire personnel that are responsible for structural and wildland fire response would be impacted by this project. Rehabilitating the water system would have

beneficial effects on park and concessioner operations and employee safety by providing high quality drinking water and reducing the potential for system shutdowns. The additional restrooms would result in long-term, direct, localized, minor, adverse effects due to the increase in facilities and workload. Overall, the result would be a long-term, direct, localized, moderate, beneficial impact on park (and concessioner) operations, as well as the health and safety of visitors and employees. Long-term, beneficial effects would result from providing dependable and adequate water delivery, allowing for a safer work environment for fire personnel responding to structural fires, and the ability of the NPS to protect life and property in case of a fire.

Sustainable and long-term improvements in trail conditions, as well as placement of trails and bridges in more sustainable locations would provide long-term, direct, localized, minor to moderate, beneficial impacts on park resources as the new infrastructure would last for decades. Improved trails and facilities would be beneficial by reducing the need for maintenance and repairs.

Cumulative Impacts

When added to other past, present, and reasonably foreseeable future actions in Grand Teton National Park, Alternative B would initially require additional time and resources for the implementation of the project. However, once the project was complete, it would make the operations within the Jenny Lake area more efficient. Park and concessioner operations have been affected by past activities. Maintenance and repairs to existing utilities, facilities, roads, trails, and other park and concessioner operated infrastructure is ongoing. Some of these actions have improved park and concession operations, and improved safety by upgrading the facilities. The water and wastewater systems would be upgraded, thereby relieving a large burden from park operations that currently have to address emergency repairs on a regular basis. Past activities considered in this analysis include park operations by interpretation, maintenance, administration, visitor protection, and resource management personnel. Current impacts to park operations, including all associated needs for employing staff to conduct these actions (administrative, housing, vehicles, etc.), would continue in the current condition. Additional burdens on park operations typically include fire management actions (e.g., prescribed and wildland fires), human use, emergency services, and construction projects. When added to other past, present, and reasonably foreseeable future actions in the park, Alternative B would have short-term, direct, localized, minor to moderate, adverse impacts. In the long term, effects would be indirect, localized, moderate, and beneficial.

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CONSULTATION AND COORDINATION

The NPS contacted various agencies, tribes, organizations, and interested persons in preparing this EA. The process of consultation and coordination, as detailed in this chapter, is an important part of this project.

Scoping and Agency Consultation

Scoping is an early and open process to determine the breadth of environmental issues and alternatives to be addressed in an EA. Grand Teton National Park conducted both internal scoping with appropriate NPS staff and external scoping with the public and interested and affected groups and agencies. Refinements to the Preferred Alternative were made to address conflicts and issues identified as part of this process.

Internal Scoping

As described in the *Alternative Development* section in Chapter 2, an interdisciplinary team of NPS employees composed of a mix of professional disciplines including the divisions of Facility Management, Ranger Activities, Interpretation, Science and Resource Management, Business Resources and Administration, and Park Management, met frequently during 2012 and 2013. The interdisciplinary team developed project objectives and alternatives, discussed relevant impact topics to be analyzed in the EA, and developed mitigation measures to minimize potential adverse impacts. The alternative was further developed during the VA workshop held on February 11-14, 2013, as well as similar small scale VA prioritization exercises.

External Scoping

A 30-day public scoping period for the Jenny Lake Renewal Plan was conducted from August 17, 2012, through September 15, 2012. The NPS provided information about the renewal plan and the public scoping period through the following means:

1. Scoping information was posted on the NPS Planning, Environment, and Public Comment (PEPC) website for additional project information and for commenting.
2. On August 17, 2012, an electronic press release regarding public scoping was distributed to 190 individuals, agencies, and organizations by the Grand Teton National Park Public Affairs Office. The distribution list included media, conservation groups, government agencies, concessioners, and other stakeholders.
3. On August 17, 2012, a press release was published in the *Jackson Hole News and Guide*. The paper also published a more detailed article about the project on August 22, 2012, which included the public scoping information.
4. A public scoping postcard with project information and commenting procedures was sent to the general park mailing list of approximately 575 individuals, agencies, and organizations. A list of agencies, tribes, organizations and individuals contacted during the preparation of this document is available through the Grand Teton National Park Planning Office in Moose, Wyoming.
5. On August 23, 2012, a radio segment regarding the project aired on Jackson Hole Radio. This segment also included public scoping information.
6. A public scoping postcard was distributed to visitors in the park through all the park visitor centers, Exum Mountain Guides, Jenny Lake Ranger Station, and Jenny Lake Boating. The postcard included on-line commenting instructions as well as space to write comments on the

card and directions to submit the card once completed. A total of 750 scoping postcards were distributed to park visitors using these venues.

7. Public scoping information was posted on the National Parks Traveler website.
8. On August 21, 2012, scoping letters were sent to the Tribal Chairs of the park's 18 affiliated tribes.
9. On August 17, 2012, the scoping letter was sent to the USFWS. On August 24, 2012, one was sent to the WDFG.
10. On August 20, 2012, the park sent a letter to the Wyoming SHPO.

Issues and Concerns Addressed in this Document

During the 30-day public scoping period, the park received 33 letters (i.e., comment cards, PEPC comments, and letters) from 28 individuals, one agency, and four organizations. All correspondence that was received was entered into the PEPC system either from direct entry by the commentor or uploading of comment postcards and hard copy letters by NPS staff. These letters were carefully reviewed and individual comments were identified and sorted according to the subject matter addressed. The analysis of these letters identified 108 discrete, substantive comments. Concerns identified during the public scoping period are summarized below. Each of the comments received was considered and incorporated into the plan as applicable. A summary of substantive concerns that were not addressed in the plan are presented in a subsequent section along with the rationale for why they were either considered to be outside the scope of the project or otherwise not addressed.

ACCESS

Several commentors addressed access at the Jenny Lake area, noting that it should be "accessible to all." Recommendations included adding "railings to get down to the water and beach." A few commentors stressed the need to make the park more bicycle friendly. One commentor encouraged making the park child/family friendly.

FACILITIES

Commentors provided comments about the Jenny Lake facilities. Three main items were noted: the need for more restrooms, the need for improvements to the docks/dock areas, and the need to improve the parking lot.

Regarding parking at Jenny Lake, commentors noted that "there is too much traffic congestion in the parking lot and the approach to the parking area presents an overwhelming sea of concrete and vehicles." They also noted that "the flow of traffic does not work well through this area and the drop off zone in front of the ranger station is inadequate."

INTERPRETATION/EDUCATION

Several commentors provided comments about education and interpretive displays and opportunities. The commentors noted that current interpretive information is too limited/lacking and recommended increasing the amount of information available. Several commentors encouraged more education about the environment, the ecosystem, the trails, and the park itself, while other commentors noted that better signs and education about impacts would help address various visitor issues in the park (e.g., better route-finding, better understanding of the delicate nature of the environment). One commentor suggested the use of kiosks for more information.

NATURAL RESOURCES

A few commentors addressed the impact to natural resources of the Jenny Lake area due to the number of visitors. One commentor noted that the area is "being loved to death" and felt it "is appropriate and timely that the park move thoughtfully forward in redesigning this area in a way that will better serve park visitors, while also protecting the scenic, wildlife, and vegetative resources." Another commentor noted that "the String Lake Outlet is heavily overused by boaters and hikers" and that this "has led to erosion and trampled vegetation by picnickers and hikers enjoying the area." One commentor recommended "ongoing rehabilitation to occur to replenish some of the eroded areas."

ROUTE FINDING

Numerous commentors noted that route-finding "could be greatly improved" and would help "reduce visitor confusion."

TRAILS

Several commentors provided input about the Jenny Lake trails. Commentors noted that the "trail surface conditions need improvement" but cautioned "not too much." As one commentor noted, "90% of the folks who … hike to the falls and 'summit' inspiration point, have accomplished their Mt. Everest. Don't take that away from them or make it too easy." Another commentor is "against any pavement or asphalt on the west side for trail improvement."

Several commentors recommended adding/improving fencing to keep people on the trails and benches for resting.

Commentors also expressed frustration about the "tangle of walkways" at the entrance and "web of trails" from the campground.

For the Jenny Lake Overlook, one commentor recommended that the park "remove the crumbling asphalt in this area and rebuild a natural trail with fences to keep people on the trails and discourage the creation of new trails."

VISITOR EXPERIENCE

Several commentors discussed the visitor experience. Most of the commentors noted significant crowding on the trails noting that the "visitor experience is degraded because the area is too congested." Several made recommendations to address the crowding.

WILDERNESS

Two commentors addressed the wilderness experience. One urged the "preservation of the wilderness values on the west side of the lake, rehabilitation of the trail system, closing off heavily used rest stops, and reducing impacts at viewing sites through the use of fencing in select areas." The other commentor noted that it was "anything but a wilderness experience" due to the heavy use.

Issues and Concerns Not Addressed in this Document

The following issues were identified during public scoping and are not addressed in this planning effort for the reasons provided:

TRANSPORTATION

Several commentors addressed transportation to and within the area. Recommendations included limiting/decreasing the number of personal vehicles and encouraging use of alternative transportation such as busses, shuttles, and bicycles. Management understands that an increase in the use of alternative transportation such as a shuttle system is important for many reasons;

however, increasing the numbers of visitors to the Jenny Lake frontcountry could have unintended consequences in the more fragile backcountry areas. Increases in current visitation levels must be supported with future visitor use and resource studies. Bicycle use along the multi-use pathways, including the area from South Jenny Lake to North Jenny Lake, was previously addressed in the Transportation Plan EIS. Uses along the old road west of the campground and the one-way loop would remain unchanged and are out of the scope of this project.

FACILITIES

Commentors expressed the desire/need for restroom facilities at String Lake Outlet. When designs are further developed in the String Lake Outlet area, the park will take into consideration placing a new vault toilet in a previously disturbed area.

One commentor recommended considering "a secondary public boat launch area since the current parking lot is usually overrun with vehicles unloading boats and users are funneled into a very narrow lakeshore/trail system." Commentors also recommended adding restrooms and trash receptacles "in the boat launch area, as failure to do so is contributing to degradation of the area." The park will continue to monitor the public boat launch to determine the need for added facilities. If it is determined they are required, they will be addressed with future compliance.

Commentors encouraged adding a "bridge on the north side around the inlet from String." This is out of the project area, but will be taken into consideration when the park addresses future work in the String Lake area.

VISITOR EXPERIENCE

Several commentors stated that the Jenny Lake area is too crowded or the park should set visitor use limits. Another stated that congestion and overcrowding was noted as an issue, but cautioned, "Don't limit the number of visitors who get to explore Jenny Lake. It is a gift that all park visitors deserve to see." Another commentor recommended "a carrying capacity study be completed for the Hidden Falls and Inspiration Point area." Visitor use capacity of the Jenny Lake area was not addressed in the plan, as park management has determined future visitor use and resource studies would be required to make the best management decision for appropriate use of this area.

Two commentors were frustrated with airplane noise. The sounds related to aircraft and the airport are out of the scope of the EA.

TRAILS

While trails are a large part of the Jenny Lake Renewal Plan, certain comments were not addressed or incorporated into the proposed action. One commentor stated that horses "have no business being in such a heavily trafficked area," while another commented that a horseback trip from Jenny Lake Lodge is the "highlight of our stay" and "horseback rides allow visitors to experience a small part of history of how the west was settled and of transportation in the early days." The addition of a new spur trail to the north would provide a bypass trail that would separate the uses of stock and/or through hikers (those hiking around the lake but not going to Hidden Falls or Inspiration Point) with hikers queuing for the boat. The purpose of this trail is to give users a route to access the southern Horse Trail from the southwest Jenny Lake Trail. Changes in permitted horse use and numbers are out of the scope of this EA.

One commentor recommended pavement or wooden walkways from the west boat dock to Hidden Falls to decrease erosion and resource impacts and to increase accessibility. Another

recommended more trails in the backcountry so people could spread out and reduce crowding. Trail design and materials used throughout the recommended wilderness of Jenny Lake were thoughtfully considered to balance heavy visitor use with protection of wilderness character.

PARK OPERATIONS

Several commentors stated that there should be an increase in park or other personnel in the project area, particularly the backcountry, to help with education, interpretation, and safety. Personnel and staffing are determined based on available funding, which is limited and outside of the scope of this project.

CONCESSIONS

A number of commentors expressed concerns about the amount of boat use and the availability of certain types of boats for rent. One commentor also stated that the store hours and season should be extended. These types of comments were not considered because they are determined as part of the concessioner contract that will be negotiated separately when the contract is up for renewal.

One commentor recommended implementing an advance reservation system for the Jenny Lake Campground to help reduce the crowding as people look for campsites. This is a concessioner operated campground, and is therefore out of the scope of the EA.

Agency Consultation

In accordance with the ESA, the park contacted the USFWS with regard to federally listed special status species, and in accordance with NPS policy, the WGFD was also contacted during the public scoping period. The WGFD sent a comment letter stating that they had no terrestrial wildlife or aquatic concerns related to the project. No response was received from the USFWS. These agencies will be notified of the availability of the EA for review. Any issues or concerns that are identified at that time will be addressed by the NPS.

The undertakings described in this document are subject to section 106 of the NHPA. Consultations with the Wyoming SHPO have been ongoing since inception of the project and this EA will be submitted to the Wyoming SHPO for review and comment. A letter was sent to SHPO seeking concurrence on the adverse effect on December 10, 2013. A letter will be sent to ACHP after the park receives concurrence from SHPO on the adverse effect. The park sent consultation letters to other consulting parties (Alliance for Historic Wyoming, Jackson Hole Historical Society, National Trust for Historic Preservation, and Teton County Historic Preservation Board) in January 2014 as well.

The agencies/individuals contacted in the process of preparing this EA are listed below:

- Don Simpson, Director, Wyoming State Office, Bureau of Land Management;
- Shane DeForest, Pinedale Field Manager, Bureau of Land Management;
- Lance Porter, Bureau of Land Management, Rock Springs Field Office;
- Matthew Bilodeau, Program Manager, WY Regulatory Office, Army Corps of Engineers, Omaha District, Cheyenne, WY;
- Bob Bonds, Environmental Coordinator, Wyoming Department of Transportation;
- John Corra, Director, Wyoming Department of Environmental Quality;
- Scott Talbott, Director, WGFD;
- Mark Gocke, WGFD;
- Jacque Buchanon, former Forest Supervisor, Bridger-Teton National Forest;

- Brent Larson, Forest Supervisor, Caribou-Targhee National Forest;
- Mary Erickson, Forest Supervisor, Gallatin National Forest;
- Steve Kallin, Refuge Manager, National Elk Refuge;
- Katry Harris, Federal Property Mgmt. Sect., ACHP;
- Jason Fearneyhough, Director, Wyoming Department of Agriculture;
- Jerimiah Rieman, Natural Resources Policy Advisor, Governor's Policy Office;
- Bill Crapser, State Forester, Wyoming Office of State Lands and Investments;
- George Ritz, Regional Hydrologist, U.S. Geological Survey, Colorado Water Science Center;
- Randy Williams, Executive Director, Teton Conservation District;
- Ann Belleman, Biologist, USFWS;
- Mark Sattelberg, Field Supervisor, Wyoming Field Office, USFWS;
- Lorri Lee, Regional Director, Northwest Regional Office, Bureau of Reclamation;
- Mike Beus, Water Operations Manager, Jackson Lake Dam, Bureau of Reclamation;
- Mary Hopkins, State Historic Preservation Officer, Wyoming SHPO;
- Suzanne Bohan, NEPA Program Director, U.S. Environmental Protection Agency;
- Joe Dailey, Wyoming Division Administrator, Federal Highway Administration; and
- Astrid Martinez, State Conservationist, USDA Natural Resources Conservation Service.

American Indian Consultation

A number of tribes traditionally, and currently, value the area surrounding Grand Teton National Park for hunting, gathering, ceremonial, and other practices. In August 2012, the NPS sent the scoping letter to the following tribes.

- Apache Tribe of Oklahoma
- Fort Peck Assiniboine and Sioux Tribes
- Blackfeet Tribe
- Burns Paiute Tribe
- Coeur d'Alene Tribe
- Comanche Nation
- Confederated Salish and Kootenai Tribes
- Confederated Tribes of the Colville Reservation
- Confederated Tribes of the Umatilla Reservation
- Crow Tribe
- Eastern Shoshone Tribe of the Wind River Reservation
- Fort Belknap Indian Community
- Kiowa Tribe of Oklahoma
- Nez Perce Tribe
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Shoshone-Bannock Tribes
- Confederated Tribes and Bands of the Yakama Nation

No comments were received from any tribes. Additional consultation letters were sent to 23 tribes on December 26, 2013. The tribes will be notified of the availability of the EA for review. The NPS will address any issues or concerns that are identified by the tribes during their review.

List of Preparers

The people identified below participated in the development of this EA.

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APPENDIX A. WILDERNESS MINIMUM REQUIREMENT DECISION GUIDE

GRAND TETON NATIONAL PARK

WILDERNESS MINIMUM REQUIREMENT DECISION GUIDE

WORKSHEET

February 7, 2014

National Park Service policies direct all management decisions affecting wilderness to apply the concept of "minimum requirement" for the administration of the area regardless of wilderness category. This concept is a documented process used to determine if administrative actions, projects, or programs undertaken by the Service or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts.

The minimum requirement concept is applied as a two-step process that determines:

- Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not cause a significant impact to wilderness character and resources, in accordance with the Wilderness Act; and
- The techniques and types of equipment needed to ensure that impacts on wilderness character and resources are minimized

This Minimum Requirement Decision Guide is designed to assist Grand Teton managers to be excellent stewards of our wilderness.

PART 1: BACKGROUND INFORMATION

1. Project Title and Personnel Affiliation.
Jenny Lake Renewal Project
National Park Service—Grand Teton National Park
Project construction would be conducted by park trail crews. The interpretative portion of this project would take place with the assistance of interpretive staff.

2. Briefly describe the situation that may prompt action within wilderness. (Why should anything be done?)
For decades, visitors to the Jenny Lake wilderness area have gathered on narrow trails creating crowding and deterioration of the main trail corridors and viewing areas. In many areas, the trails were built in the 1930s and were not designed to accommodate today's large number of visitors. Examples of the issues in the project area include poor drainage and steep pitches resulting in continuous erosion, overcrowding on trails and viewing areas resulting in trampled

vegetation and compacted soil, and very limited interpretation of the wilderness status of the Jenny Lake area.

3. Provide a justification of why the project should occur within wilderness.
The project area includes the west side of Jenny Lake including Hidden Falls and Inspiration Point. This portion of the project is located within recommended wilderness.

4. Would the project meet the requirements of various laws, regulations, policies, management plans, and other guidance? If so, provide specific information, including reference (e.g. title, section, page number(s), quotation).
The project would meet the requirements of the following policies and plans.

National Park Service Management Policies (2006)
6.1 General Statement
The purpose of wilderness in the national parks includes the preservation of wilderness character and wilderness resources in an unimpaired condition and, in accordance with the Wilderness Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

6.3.10.2 Trails in Wilderness
Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation or where significant safety hazards exist during normal use periods. Historic and/or prehistoric trails will be administered in keeping with approved cultural resource and wilderness management plan requirements. Borrow pits are not permitted in wilderness areas, with the exception of small-quantity use of borrow material for trails, which must be in accordance with an approved minimum requirements analysis.

6.3.5 Minimum Requirement
All management decisions affecting wilderness must be consistent with the minimum requirement concept. This concept is a documented process used to determine if administrative actions, projects, or programs undertaken by the Service or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts. The minimum requirement concept will be applied as a two-step process that determines:

- Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character, in accordance with the Wilderness Act; and the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized.
- When determining minimum requirements, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than,

economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

6.3.10.4 Signs

Only those signs necessary for visitor safety or to protect wilderness resources, such as those identifying routes and distances, will be permitted. Where signs are used, they should be compatible with their surroundings and the minimum size possible.

6.4 Wilderness Use Management

The National Park Service will encourage and facilitate those uses of wilderness that are in keeping with the definitions and purposes of wilderness and do not degrade wilderness resources and character. Appropriate restrictions may be imposed on any authorized activity in the interest of preserving wilderness character and resources or to ensure public safety.

When resource impacts or demands for use exceed established thresholds or capacities, superintendents may limit or redirect use. If these actions are determined to be the minimally required level of management, physical alterations, public education, general regulations, special regulations, permit systems, and the local restrictions, public use limits, closures, and designations implemented under the discretionary authority of the superintendent (36 CFR 1.5 and Part 13; 43 CFR Part 36 for Alaska units) may all be used in managing use and protecting wilderness.

6.4.1 General Policy

Park visitors need to accept wilderness on its own unique terms. Accordingly, the National Park Service will promote education programs that encourage wilderness users to understand and be aware of certain risks, including possible dangers arising from wildlife, weather conditions, physical features, and other natural phenomena that are inherent in the various conditions that comprise a wilderness experience and primitive methods of travel. The National Park Service will not modify the wilderness area to eliminate risks that are normally associated with wilderness, but it will strive to provide users with general information concerning possible risks, any recommended precautions, related user responsibilities, and applicable restrictions and regulations, including those associated with ethnographic and cultural resources.

6.4.2 Wilderness Interpretation and Education

In the context of interpretive and educational planning, national park system units with wilderness resources will (1) operate public education programs designed to promote and perpetuate public awareness of and appreciation for wilderness character, resources, and ethics while providing for acceptable use limits; (2) focus on fostering an understanding of the concept of wilderness that includes respect for the resource, willingness to exercise self-restraint in demanding access to it, and an ability to adhere to appropriate, minimum-impact techniques; and (3) encourage the public to use and accept wilderness on its own terms—that is, the acceptance of an undeveloped, primitive environment and the assumption of the

potential risks and responsibilities involved in using and enjoying wilderness areas. NPS interpretive plans and programs for wilderness parks will address the primary interpretive themes for wilderness. Education is among the most effective tools for dealing with wilderness use and management problems and should generally be applied before more restrictive management tools.

6.4.3 Recreational Use Management in Wilderness

Recreational uses of NPS wilderness are generally those traditionally associated with wilderness and identified by Congress in the legislative record for the development of the Wilderness Act and in keeping with the language provided by sections 2(a) and 2(c) of the act itself (16 USC 1131(a) and (c)). These recreational uses of wilderness will be of a type and nature that ensures that its use and enjoyment (1) will leave it unimpaired for future use and enjoyment as wilderness, (2) provides for the protection of the area as wilderness, and (3) provides for the preservation of wilderness character. Recreational uses in NPS wilderness areas will be of a nature that:

- enables the areas to retain their primeval character and influence;
- protects and preserves natural conditions;
- leaves the imprint of man's work substantially unnoticeable;
- provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and
- preserves wilderness in an unimpaired condition.

The policies contained in this chapter are supplemented by Director's Order #41: Wilderness Preservation and Management and Reference Manual 41, which accompanies the director's order. Those documents should be referred to for more detailed information.

Grand Teton National Park Foundation for Planning and Management (2006)

- Visitor Experiences in an Outstanding Natural Environment
- Spectacular setting and quality natural environment
- Opportunities to observe wildlife
- Full spectrum of access, ability level, activities, year-round
- Wilderness character, opportunities for solitude, natural lightscapes, natural soundscapes

Grand Teton National Park Wilderness Recommendation (1978)

AUTHORITY: Wilderness Act of 1964 (Public Law 88-577; 16 U.S.C. 1131-1136); Pursuant to the Wilderness Act of 1964, the NPS evaluated lands within Grand Teton National Park for possible designation by Congress as Wilderness. In 1978, a wilderness recommendation was provided to Congress which included 122,604 acres as Recommended Wilderness and an additional 20,850 acres as Potential Wilderness. Over the years, the park has reviewed and revised its wilderness maps on numerous occasions: however, the actual recommendation that was sent to Congress in 1978 has never been superseded. Under current NPS management policies, the park

manages all of the lands that were included in the 1978 recommendation in the same way as if they had been designated by Congress as wilderness.

Grand Teton National Park Backcountry Management Plan (1990)
The Backcountry Management Plan for Grand Teton National Park explains the policies and actions used at the park, for backcountry and wilderness management; identifies long-range management goals, intermediate objectives, and actions and options to meet those objectives; and is a working guide for employees who manage the backcountry. The Backcountry Management Plan defines "Backcountry" as any undeveloped area at least 250 yards from a road, including recommended and potential wilderness areas.

Grand Teton National Park Master Plan (1976)
Land Classification, Visitor Use, Resource Use Capacities, and Management Objectives.

Grand Teton National Park Wilderness Recommendation (1972)
Original Wilderness Proposal, Recommended Additions, and Identification of Wilderness Management Facilities and Practices.

5. Proposed Project Description. The proposed project will be evaluated using MRA guidelines. Describe the action and the components of the action including methods and techniques that will be used and mitigation measures.

The following descriptions are based on preliminary designs and the best information available at the time of this writing. Specific details used to describe the alternative are estimates and could change during final site design.

Backcountry

The backcountry design and construction work includes rerouting and restoration of some trails, addressing circulation and crowding, and improving viewing areas. The backcountry effort encompasses all areas west of the public boat launch on South Jenny Lake around the lake to Hidden Falls and Inspiration Point. This effort includes the west boat dock, the Hidden Falls/Inspiration Point viewing areas, and associated trails in this area (Figure 12). Specific details about the proposed work are presented below in a generally clockwise order beginning at the west boat dock.

By policy, parks that have recommended wilderness have a responsibility to preserve wilderness values and must use a two-part minimum requirement analysis process to effectively analyze all proposed administrative actions that may affect wilderness character and values. This is integrated with, and supplemental to, NEPA, the National Historic Preservation Act (NHPA), and other compliance requirements. Motorized transportation, including helicopters, and mechanized tools and equipment, would only be used when determined to be the minimum tool needed to successfully accomplish the project.

- **West Boat Dock.** The west boat dock is the first feature that visitors arriving via the commercial boat service encounter in the backcountry. Through education, one-way, clockwise travel would be encouraged from this location to trails in the backcountry. The new circulation would be designed to be a complete, intuitive, self-guiding loop system. This would reduce crowding and improve opportunities for solitude. This new one-way circulation would require queuing to occur on the boat dock. To accommodate this, the square footage of the boat dock would be increased to approximately 1,200 square feet (from approximately 420 square feet currently). The entire existing dock, including the substructure, would be replaced. The new, larger dock would provide ample waiting room for visitors unable to hike the trail, with available space for queuing that accommodates wheel chairs and other seating. Part of the dock would be floating with a new substructure constructed with micro-pilings augered into the bedrock, piers set on the pilings, and steel beams on the piers. The wooden staircase would be replaced and eroded soils and denuded vegetation around the queuing area would be curtailed with the addition of retaining structures. Several areas of the trail would be widened and rustic dry-laid native boulders/stone retaining walls and natural seating areas would be added for visitors waiting for the boat.
- **Dock Bypass/Stock Trail**. The addition of a new spur trail to the north would provide a bypass trail that would separate the uses of stock and/or through hikers (those hiking around the lake but not going to Hidden Falls or Inspiration Point) with hikers queuing for the boat. The purpose of this trail is to give users a route to access the southern Horse Trail from the southwest Jenny Lake Trail or to complete the loop around the lake without going up the Hidden Falls Trail. This would also provide a short loop hike to Cascade Creek Overlook and bridge, and then back to the boat dock.
- **Cascade Creek Overlook and Bridge.** This bridge would replace the existing bridge at Confusion Junction. The existing bridge (approximately 30 feet in length with a lifespan of five to 10 years) would be removed. The proposed design moves the location of the bridge and eliminates Confusion Junction from the trail network. The new bridge would be approximately 53 feet in length and have a lifespan of 50+ years. It would be relocated approximately 100 feet to the east (downstream) in a more sustainable location because it is higher above the creek and would be less likely to be washed out in high water years. The design, which would accommodate horse traffic, requires a new elevated trail with retaining walls to be created from the south side of the new bridge abutment that would link to the existing trail to the south. The new bridge could become a destination in itself, as it would overlook a deep cascade-filled canyon.
- **Confusion Junction Reroute.** Four trails currently merge at “Confusion Junction,” a popular creek viewing area, half way between Hidden Falls and the boat dock. Although

the space is defined by buck and rail fencing and large boulders along the creek edge, it is a large impacted area where human and horse uses converge. Once a visitor arrives, there is confusion as to where to go next. Soil and vegetation resources at the knoll of this area and along the creek are severely impacted with large areas of bare ground and exposed roots. Under this alternative, the trail would be re-routed and located on the south side of Cascade Creek and northwest of Confusion Junction. As part of this re-route, the Cascade Creek Bridge (see above) would be relocated, and the area would be restored to its natural condition. A spur trail to the south side of the former bridge would remain, to provide a creekside overlook and seating area that would be accessed via the existing trail along the south side of the creek. The existing impacted areas and four trails extending out from the junction would be reclaimed.

- **South Cascade Creek Trail and Hitching Post.** Erosion control and trail repairs are proposed along the central trail segment on the south side of Cascade Creek. The west end of the South Cascade Creek trail includes a horse hitching post site that is heavily impacted from years of use. The project would decrease the size of this bare ground area by installing natural barriers around the area to prevent further degradation and to close off user-created trails down to the creek. The impacted areas beyond the barriers would be revegetated. The plan would also build a causeway over the roots of a large Engelmann spruce tree and replace an existing culvert that drains the wet hillside.
- **Hidden Falls Overlook.** Congestion in the Hidden Falls area would be addressed by adding a new spur trail that would allow visitors to enter the area from the slope behind the viewing area (to the south) and encourage one-way circulation. The new trail, at a slightly higher elevation than the Hidden Falls Overlook, would enter the area from above, with the overlook located at the end of the trail. The new trail also allows visitors a place to queue before arriving at the overlook. The new spur entry trail would originate approximately 100 feet to the east of the viewing area. The existing trail (at the new spur junction) would be slightly realigned and signed so that hikers would follow the new spur trail for entry to the Hidden Falls area. The existing entry trail would be utilized as the exit trail. This alternative would also provide an improved surface at the overlook and a less intrusive barrier (native boulders instead of buck and rail fencing) to separate the overlook from Cascade Creek. The surface area of the overlook would be improved and additional natural seating opportunities would be provided.
- **Hidden Falls Bridges.** The two bridges between Hidden Falls and Inspiration Point would be replaced. The existing bridges have a lifespan of only five to 10 years and would be replaced with bridges with a much longer lifespan (50+ years). A natural stone surface would be applied to the area between the two bridges with native boulders to provide natural seating opportunities.

- **Inspiration Point Trail.** This segment of trail is located between Hidden Falls and Inspiration Point and includes Rendezvous Point, a steep area located midway up the Inspiration Point Trail. Throughout this area, existing drains and water diversions (checks) in the trail would be repaired and updated, and new checks would be installed in order to repair erosion-caused gullies, generally improve the trail conditions, and prevent future erosion. Large quantities of stone and fill would be required to properly repair the large gullies in the lower portion of this trail segment. In the Rendezvous Point area there is a narrow and failing system of steps and water erosion bars. The upper portion of the trail is extremely rocky with an uneven surface and some large steps. This section would be kept mostly in its present state because it provides a challenge to visitors and enhances the visitor wilderness experience of the area. Checks would be added to reduce erosion at the bottom of the trail segment and to make the trail surface more uniform. A CCC-era retaining wall in this area would also be repaired and stabilized.
- **Inspiration Point**. The main trail that passes through the Inspiration Point area and continues into Cascade Canyon would be better defined to eliminate confusion. An existing user-created trail located at an elevation below the main trail would be made official and signed as the Inspiration Point Viewing Trail. This loop trail would pass added small boulder seating/viewing areas that would provide visitors a place to rest. Other user-created trails would be closed and rehabilitated. Native stone boulders would be imported or relocated from on-site to provide natural seating in these viewing areas and define limits of impacts. Imported stone would blend with other rock located throughout the area. Work in this location seeks to encourage visitors to use the viewing areas via the trail rather than traveling on vegetation and further degrading natural resources. From Inspiration Point, visitors have the option of hiking farther into Cascade Canyon and the backcountry (which is outside the project area) or returning back down the Inspiration Point Trail to the junction of the North Cascade Creek Trail. Returning to the boat dock via the North Cascade Creek Trail would be encouraged to further promote the clockwise circulation pattern.
- **North Cascade Creek Trail**. This trail segment is located on the north side of the western portion of Cascade Creek. The majority of the trail structures are either constructed of timber or of stone that need repositioning and/or widening. Treatments proposed in this segment include construction of a retaining wall, causeway, water bars, new steps, and erosion checks.
- **Horse Trail.** This segment of trail requires rebuilding of many failing trail structures and the addition of many strategically located checks and water bars to keep the current

steep trail from further degradation. A few narrow areas of the trail will be widened to allow packer trains to navigate in a safer fashion.

6. Where would field activities occur within wilderness? Provide specific geographic locations (e.g. coordinates, place names).

The backcountry effort of this project included in the recommended wilderness are the Southwest Jenny Lake Trail beyond the west of the public boat launch lake edge at the west boat dock, and Hidden Falls and Inspiration Point and their associated trails.

7. When would field activities occur within wilderness? Include estimated start and end dates/months and duration in the field (days/weeks/months).

Activities would occur during the spring, summer, and fall over a period of three to four years, beginning in 2014.

8. How many field personnel would be participating in the project?

At least four crews comprised of up to five individuals per crew would be participating in the project.

9. Would any of the following be utilized in wilderness?

- Mechanical transport (motorized and/or non-motorized) **Yes:** ☒ **No:** ☐
- Motorized equipment (e.g. chainsaws, generators, power tools) **Yes:** ☒ **No:** ☐
- Landing of aircraft **Yes:** ☒ **No:** ☐
- Temporary road construction **Yes:** ☐ **No:** ☒
- Placement of structures and/or installations **Yes:** ☒ **No:** ☐

If yes was checked for any of the above, provide details. Include types of equipment and frequency of use; duration of installations/structures (weeks, months, years, permanent); size, shape, color of installations/structures; specific location(s) of installations/structures; and duration of motorized equipment use (minutes, hours, days).

Mechanical transport would involve the use of carts and wheelbarrows and helicopters use (up to 40 round-trips per day [420 total flight hours] and 1,780 tons of material to be transported over 36 days) to transport materials to the project staging areas. Helicopter transport would be used to transport stone and gravel as well as steel beams and wood for bridge reconstruction. Current estimates of quantities of material require approximately two weeks of helicopter flights a year– one week in the spring and one week in the fall – for three or four seasons.

Motorized equipment would involve the use of chainsaws, gas or electric rock drills (used with associated small explosive charges or other means to cleave rocks), and motorized wheelbarrows. This equipment would be used during 10-hour work days intermittently throughout the duration of the proposed project. The park would consider electric drills and saws powered by a gas generator if determined to be less intrusive, but still able to meet operational needs.

Structures and installations would include trail checks, waterbars, causeways, steps, retaining walls, and culverts. The number, location, and size/scale of these structures and installations would be kept to the minimum necessary for visitor safety and resource protection totaling approximately 190 erosion checks, 270 linear feet of retaining wall, and 12 water bars.

10. How would field personnel, equipment, and supplies enter and travel within wilderness?
Field personnel would travel on foot or by horse and/or mule. Equipment and supplies would travel mainly by person or mule with aid of carts and wheelbarrows. Helicopter transport would be used to transport steel beams and wood for bridge reconstruction, and stone and gravel.

11. Would there be any vegetation and/or ground disturbance within wilderness?

Yes: ☒ **No:** ☐

If yes was checked, provide details. Include type of vegetation, number of trees, area of vegetation denuded or removed, area and depth of ground disturbed, duration of excavation (temporary – minutes, hours, days, weeks, months; permanent excavated area), type of equipment to remove vegetation and/or excavate, and whether excavated material is stockpiled temporarily or permanently (provide extent of time for stockpile).

Minor reroutes of trails for resource protection would occur on the north side of Cascade Creek and south side of Cascade Creek. Refer to the figures of the proposed action in Chapter 2 of the Jenny Lake Renewal Plan Environmental Assessment (EA) for locations. The majority of the trail reclamation areas along the south and west sides of the Jenny Lake trail system are narrow disturbances containing compacted trail tread with adjacent intact native plant communities. Compacted soils that occur in trail tread and associated impacted areas can have negative ecological effects, including alterations to local hydrology and increased soil erosion. Highly compacted soils postpone or prevent native plant recruitment and often result in an environment that facilitates exotic plant recruitment and development. To facilitate revegetation, the soils in the reclaimed trail tread would be physically decompacted using hand tools; topsoil would be imported for denuded areas that are eroded; the decompacted soil would then be seeded with a native seed mix; and non-native plants would be treated for a period of up to three years or until the populations are controlled and native plants re-establish in the trail tread. Seed application would occur via hand broadcasting and manually raking of seed into soil to maximize seed to soil contact. Non-native plant treatments would be conducted with both backpack spray crews and horseback weed crews.

12. Would the project involve collecting park resources or capturing animals?

Yes: ☒ **No:** ☐

If yes was checked, provide details. Include species, number, location(s), duration of capture, and extent of collaring/tagging/marking.

Approximately 200 rocks would be harvested within the project area from talus slopes at the western end of the Horse Trail, to the south of Hidden Falls, and along Cascade Creek.

13. Would the project involve any of the following activities?

- Staging areas **Yes:** ☒ **No:** ☐
- Backcountry camping **Yes:** ☐ **No:** ☒
- Temporary caches **Yes:** ☒ **No:** ☐

If yes was checked, provide details. Include what is being stored and the location, extent (size), and duration (hours, days, weeks, months) of staging areas and temporary caches. Include the location and size of campsite(s) with number of individuals involved in camping.

The temporary staging areas would be located at each end and in the middle of each work area. Refer to the EA which identifies potential work areas. To the largest extent possible, staging areas would be either in the existing trail prism, on adjacent slick rock, or in barren/denuded areas. The sizes of these areas would differ based on site area, topography, and particular work feature being installed. Staging locations would be utilized for the entire work season and, would be restored at the end of the season at the direction of the park Revegetation Branch.

PART 2: BENEFITS

1. Would the project benefit any of the following public purposes of wilderness?

- Recreation ☒
- Scenic ☒
- Scientific ☐
- Education ☒
- Conservation ☒
- Historical Use ☒

Recreation – opportunities that allow visitors to experience wilderness as *wilderness*.
Scenic – visual experience provided by natural features of wilderness.
Scientific – research, inventory, and monitoring of wilderness resources.
Education – interpreting and educating wilderness resources.
Conservation – preserving or restoring natural conditions.
Historic Use – the historic and pre-historic sites, artifacts, structures, or cultural landscapes present and the human activities that once occurred within wilderness.

If yes is checked for any of the above, explain how below.

The proposed project would benefit the natural quality of wilderness through the reduction of unofficial trails, and restoration of eroded areas and compacted soils.

Although over 200,000 people visit the wilderness project area between June and September annually, the proposed project would implement ways to improve opportunities for solitude by recommending visitors travel to Hidden Falls and Inspiration Point through a one-way trail loop system. This would encourage, but not require, visitors to travel in one direction, thereby reducing two-way trail congestion and subsequently reducing the encounter rate and improving solitude.

The project would involve the rehabilitation of several trails and destination areas on the west side of Jenny Lake. This would benefit *conservation* directly and *recreation* by reducing crowding and *scenic* by reducing crowding, congestion, and denuded areas. The project would rehabilitate sections of the historic trails. The project also would incorporate an interpretive program that will specifically address wilderness stewardship e*ducation* for park visitors. Benefits to the public purpose of *education* would be facilitated by the enhanced intellectual and emotional connections to the area's cultural, natural, and wilderness resources that could create connections for visitors that foster a sense of wilderness stewardship.

See the EA, *Affected Environment and Environmental Consequences,* for a full description and analysis of the project impacts on Wilderness and Natural Soundscape.

PART 3: ALTERNATIVE METHODS

If the project is proposing to utilize one of the following (mechanical transport, motorized equipment, landing of aircraft, temporary road, and/or structure and/or installation), provide a description of one or more alternative methods that proposes avoiding or reducing these uses.

For each project component (e.g., transportation to site, site work, removal of materials, site reclamation) describe alternative methods that would complete each project component utilizing minimum requirement considerations.

Project Component	Proposed Alternative	Mitigating Methods
Initial Material Transport to staging area	1,780 Tons By Helicopter	Reduce material to transport Use higher capacity helicopter (fewer trips)
Material Transport to final location	By motorized wheelbarrow	By mechanical wheelbarrow
Site Work	Use of gas power drill, chainsaw	Use of fewer non-traditional tools
Erosion rehab	Fill eroded gullies	Less fill for eroded gullies
Erosion Control	Use many trail checks, water bars, etc.	Reduce number of checks and water bars
Node Rehabilitation	Boulder seating areas	No boulders used just for seating

Note: There is no traditional tool only alternative because the scale of the proposed rehabilitation precludes the use of only traditional tools with no motorized or mechanical transport. Moving about 1,600 tons of stone and fill by non-motorized and mechanical means would in some instances be impossible and otherwise would take many years.

Changes that would reduce the adverse impacts to wilderness character include reducing the amount of materials needed to be transported to the area and would reduce the use of motorized equipment and transport. This could include, for example, using less fill in eroded gullies, reducing the number of stones used for checks, seating, and barriers, using larger helicopters with larger payload capacity, and harvesting more material locally. Each of these changes would reduce the number of helicopter trips, motorized wheelbarrow hours, etc.

The remaining sections represent the documented process for determining the minimum requirement in wilderness.

PART 4: OPTIONS OUTSIDE OF WILDERNESS

Is action necessary <u>within</u> wilderness? Refer to project proponent's response in Part 1, Number 2 and 4.

Yes: ☒ **No:** ☐

If there is a discrepancy between the project proponent's response and the park's response, provide an explanation below.

PART 5: LEGISLATION, REGULATIONS, AND POLICIES

Note: The recommended (and potential) wilderness within Grand Teton National Park has not been designated by Congress. Therefore, there are no applicable existing rights or special provisions.

1. **Is action necessary to meet the requirements of other laws and regulations? If so, cite specific section(s).** Refer to response in Part 1, Number 5.

   Yes: ☐ **No:** ☒

2. **Is Action necessary to meet the requirements of Grand Teton National Park management plans, species recovery plans, or agreements with tribal, state, and local governments or other federal agencies? If so, cite specific section(s).** Refer to response in Part 1, Number 5.

   Yes: ☒ **No:** ☐

   See Part 1, Number 5 Grand Teton National Park's Backcountry Management Plan

PART 6: WILDERNESS CHARACTER

Based on the project proponent's response in Part 2, would the project benefit the following qualities of wilderness characters?

Untrammeled	☐
Undeveloped	☐
Natural	☒
Outstanding opportunities for solitude or primitive and unconfined recreation	☒

If there is a discrepancy between the project proponent's response and the park's response, provide an explanation below.

PART 7: PUBLIC PURPOSES OF WILDERNESS

Based on the project proponent's response in Part 2, would the project benefit the following public purposes of wilderness?

	Yes
Recreation	☒
Scenic	☒
Scientific	☐
Education	☒
Conservation	☒
Historic Use	☒

If there is a discrepancy between the project proponent's response and the park's response, provide an explanation below.

PART 8: RECOMMENDATION FOR ACTION

Is any action <u>necessary</u> in wilderness? Response based on Sections 4 through 7.
Yes ☒ **No** ☐
Provide a descriptive summary to the responses.

The administrative action, once concluded, will enhance the natural qualities of wilderness by reducing the area impacted by trails, reducing soil compaction, and rehabbing to natural conditions areas that are currently denuded of vegetation. The action would also benefit the recreation, scenic, education, and conservation public purposes of wilderness.

<u>If</u> administrative action is necessary in wilderness, the park completes Parts 9 through 11.

PART 9: ALTERNATIVES

Alternative A: No Action.

Alternative A provides a baseline for evaluating the changes and impacts presented in the action alternative. Under the No Action alternative, the NPS would continue to manage NPS visitor services at Jenny Lake as it currently does. NPS managers would continue to take necessary actions to resolve unanticipated problems that arise and would continue to strive to protect and preserve natural, cultural, and wilderness resources in the Jenny Lake area, while also providing for a safe, quality visitor experience. Routine maintenance of the trails and facilities would continue as funds are available, but overall upgrades and redesign to the trails and facilities in the Jenny Lake area would not occur. Current trail structures and alignments would remain in place. User-created trails would continue to be used and expanded if no action was taken. The trails would continue to be used for two-way travel and would not direct visitors to a certain route or direction of travel. There would continue to be an absence of wilderness-specific interpretation in the project area. No action would result in minimal rehabilitation to historic trail alignments and structures in manners consistent with current trail maintenance schedules using traditional trail construction in combination with motorized equipment. Finally, minimal safety improvements to trails would occur.

Alternative B: Proposed Action.

Refer to project description and responses to Part 1 of this Minimum Requirement Decision Guide, and any supplemental information.

Alternative C: Reduced Material/Construction

An alternative that reduces the amount of materials needed to be transported to the area would reduce the use of motorized equipment and transport. This alternative would, for example, not completely fill eroded gullies, reduce the number of stones used for checks and barriers, use larger helicopters with larger payload capacity, and harvest more material locally. Each of these changes would reduce the amount of mechanized equipment.

PART 10: IMPACT ANALYSIS

For the no action alternative, provide a brief description of both the beneficial and adverse impacts if the project does not occur within wilderness. For Alternatives B and Mitigating Methods, include both beneficial and adverse impacts that would occur during the project within wilderness. This would include transport into and out of the project area(s), on-the-ground activities (e.g. field work, camping), and the effect of activities (short-term, long-term, and permanent) after field activities have concluded (e.g. structures, installations, denuded vegetation, ground disturbance). **Score each impact as short-term (x1), long-term (x2), or permanent (3). Maximum score for each criteria is +-5.**

	Criteria	Alternative A (no action)	score	Alternative B (proposed)	score	Alternative C (Reduced Material/Construction)	score
Wilderness Character	**Untrammeled**	+ –	0	+ –	0	+ –	0
	Undeveloped	+ – Trail structures remain in place (long-term) -2 - Structures would be maintained over time perhaps using mechanical and motorized equipment (short-term) -1	-3	+ – Trail structures remain in place (long-term) -2 - Use of mechanical transport and motorized equipment (short-term, but intensive) -2	-4	+ – Fewer trail structures remain in place (long-term) -2 - Use of more non-mechanical transport and non-motorized equipment and fewer motorized trips (short-term) -1	*-3*
	Natural	+ - Continued use and expansion of user-created trails and bare ground at viewing areas (long-term) -2	-2	+ Rehabilitation of user-created trails and other denuded and compacted areas (long-term) +2 + Restroom facility education would be improved (long-term) +2 - Effects on pika from use of local stone for routine trail maintenance (short-term) -1 - Impacts from staging and construction areas (short-term) -1	+2	+ Rehabilitation of user-created trails and other denuded and compacted areas (long-term) +2 + Restroom facility education would be improved (long-term)+2 - Impacts from construction (short-term) -1 – Effects on pika from use of local stone for routine trail maintenance (short-term) -1	+2
	Solitude or a primitive and unconfined type of recreation	+ – Continued use of trails (two-way travel) and crowding (long-term) -2	-2	+ Recommended one-way travel to improve opportunity for solitude (long-term) +2 - One-way further restricts unconfined recreation (long-term) -1 - Crowding continues (long-term) -2 - Mechanical transport and motorized equipment noise (short-term) -2	-3	- Crowding continues (long-term) -2 – Reduced mechanical transport and motorized equipment noise (short-term) +1, long-term it be may be necessary intermittently as fixes are required -1	*-2*
	Other unique components	+ –	0	+ –	0	+ –	0
Public Purposes of Wilderness	**Recreation**	+ Recreational opportunities would continue (long-term) +2 – Temporary trail re-routes during routine trail maintenance (short-term mitigated) 0	+2	+ Recreational opportunities would be enhanced (long-term) +3 – Temporary trail re-routes during project (short-term mitigated) 0	+3	+ Recreational opportunities would be enhanced (long-term) +3 – Temporary trail re-routes during project (short-term mitigated) 0	+3

	Criteria	**Alternative A (no action)**	**score**	**Alternative B (proposed)**	**score**	**Alternative C (Reduced Material/Construction)**	*score*
	Scenic	+ Scenic opportunities would continue (long-term) +2 – Placement of barriers (fencing) (long-term) -2	0	+ Scenic opportunities would continue (long-term) +2 – Placement of barriers (fencing) (long-term) -2 - Use of helicopters (short-term) -1	-1	+ Scenic opportunities would continue (long-term) +2 – Placement of barriers (fencing) (long-term) -2 - Reduced use of helicopters (short-term) 0	*0*
	Scientific	+ –	0	+ –	0	+ –	0
	Education	+Education would be slightly enhanced due to the JLR Interpretative Master Plan (long-term) +1 –	+1	+ Wilderness education would be enhanced (long-term) +2 –	+2	+ Wilderness education would be enhanced (long-term) +2 –	+2
	Conservation	+ – Existing user-created trails and denuded vegetation areas would remain and expand (long-term) -2 - Effects on pika from use of local stone for routine trail maintenance (short-term) -1	-3	+ User-created trails and denuded areas would be rehabilitated (long-term) +2 – Effects on pika from use of local stone for trail maintenance (short-term) -1	+1	+ User-created trails and denuded areas would be rehabilitated (long-term) +2 – Effects on pika from use of local stone for trail maintenance (short-term). -1	+1
	Historical	+ –	0	+ Greater rehabilitation to historic trail and structures (long-term) +2 –	+2	+ Greater rehabilitation to historic trail and structures +2 –	+2
Other Criteria	**Maintaining Traditional Skills**	+ Traditional trail construction would occur in combination with motorized equipment –	0	+ Traditional trail construction would occur in combination with motorized equipment –	0	+Traditional skills would be enhanced with additional use of non-motorized equipment +1 –	*+1*
	Economic and Time Constraints	+ –	0	+ –	0	+ –	0
Safety	**Safety of Visitors, Personnel, and Contractors**	+ Minimal safety improvements to trails +1 – Periodic ongoing maintenance presents risk to park staff (short-term)-1	0	+ Greater safety improvements to trails for visitors (long-term) +2 – Intensive construction activities increase safety risk by more helicopter flights and more material to move and place (short-term) -1	+1	+ Greater safety improvements to trails (long-term) +2 +Less material to move and place (short-term) less exposure to injury+1	+1
	SCORES		-6		3		6

Impact Summary Table

Multipliers of 3X, 2X, and 1X in the Impact Summary Table account for the relative importance of impacts to 1- wilderness character, 2- public purposes, and 3- safety and efficiency.

Wilderness Character	Alternative A (no action)	Alternative B (proposed)	Alternative C (Reduced Material/Construction)
Untrammeled	0	0	0
Undeveloped	-3	-4	-3
Natural	-2	+2	+2
Solitude or Primitive and Unconfined Recreation	-2	-3	-2
Unique / Other Features	0	0	0
SUBTOTAL SCORES (X3)	-21	-15	-9

Public Purposes of Wilderness	Alternative A (no action)	Alternative B (proposed)	Alternative C (Reduced Material/Construction)
Recreational	+2	+3	+3
Scenic	0	-1	0
Scientific	0	0	0
Educational	+1	+2	+2
Conservation	-3	+1	+1
Historical	0	+2	+2
SUBTOTAL SCORES (X2)	0	+14	+16

Other Criteria	Alternative A (no action)	Alternative B (proposed)	Alternative C (Reduced Material/Construction)
Maintaining Traditional Skills	0	0	+1
Economics & Timing	0	0	0
Safety	0	+1	+1
SUBTOTAL SCORES (X1)	0	+1	+1

TOTAL SCORES	-21	0	+8

Safety Criterion

Occasionally, safety concerns can legitimately dictate choosing one alternative which degrades wilderness character (or other criteria) more than an otherwise preferable alternative. In that case, describe the positive and negative impacts in terms of risks to the public and workers for each alternative here but avoid pre-selecting an alternative based on the safety criteria in this section.

Documentation:
To support the evaluation of alternatives, provide an analysis, reference, or documentation and avoid assumptions about risks and the potential for accidents. This documentation can take the form of agency accident-rate data tracking occurrences and severity; a project-specific job hazard analysis; research literature; or other specific agency guidelines

PART 10: SUMMARY

Prior to this MRDG, the scope of the current proposal was substantially reduced from the earliest conceptual plans in order to reduce wilderness impacts (see *Alternative Development* in the EA).

Although the proposed action (Alternative B) calls for extensive use of mechanical and motorized tools and transport and traditional tools and skills, it scores higher than the no action alternative. The proposed actioncomes with substantial short-term adverse effects to wilderness character due to motorized and mechanical transport of large quantities of rock, gravel, and fill (estimated 3.7 million pounds), and long-term adverse effects to the undeveloped quality of wilderness character due to the number and extent of installations and structures.

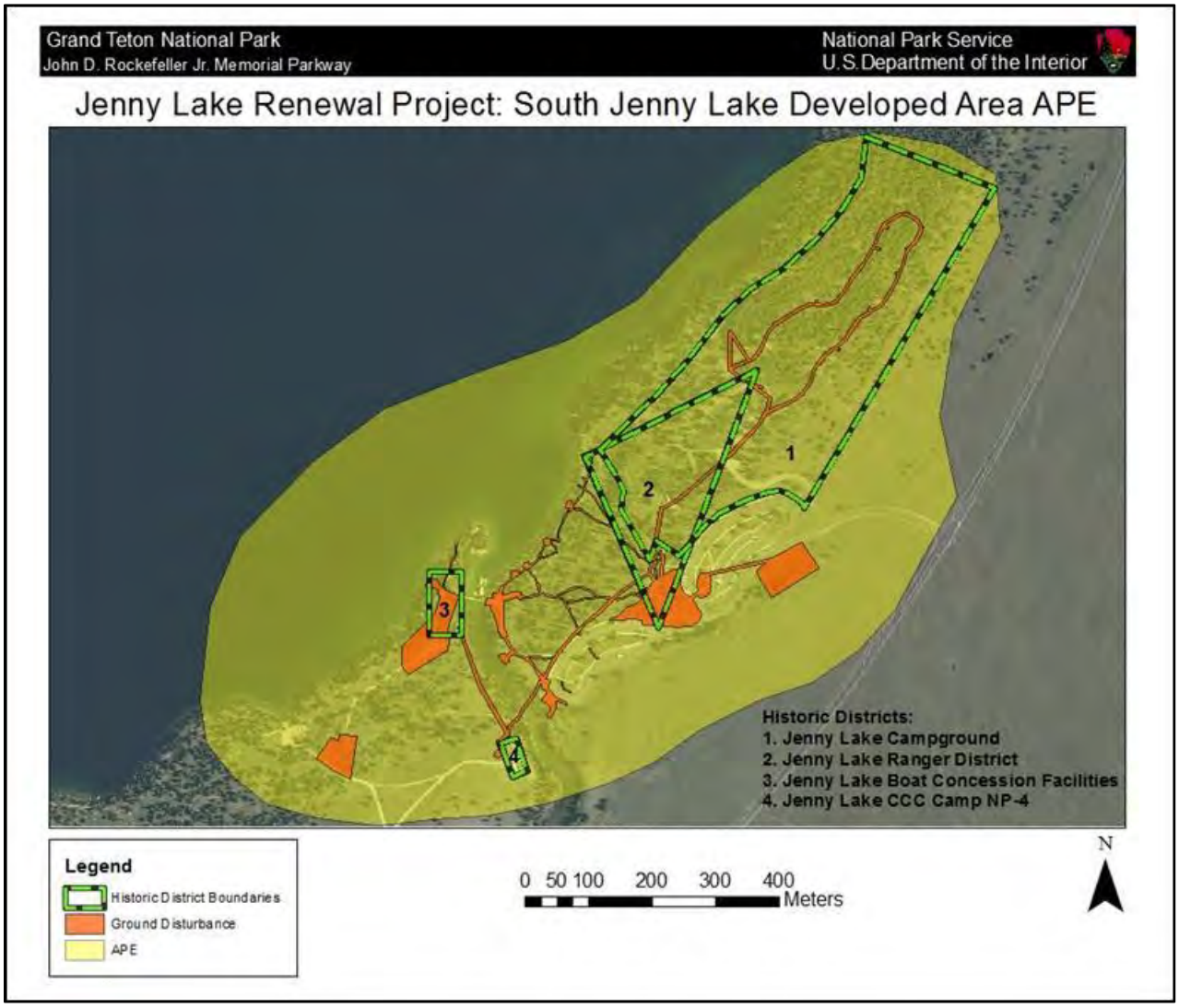
As outlined in Alternative C, any reduction of the amount of rock, gravel, and fill to complete the project, the use of more local material, the use of heavier payload helicopters for material transport, and the subsequent reduction in use of other motorized and mechanical transport, will reduce these short and long-term adverse effects.

Monitoring and reporting and other requirements:
Careful documentation of helicopter flight time, dates, and number of trips.
Careful documentation of motorized equipment use by duration in hours and dates.
Following all mitigation procedures included in the project's EA.

	Signature	Name	Position	Date
Prepared by:	Maguith	Wilson/Burson/Finlay/ Noon/Hazard/Myers/ ~~Mizelle~~	Interdisciplinary Team	2/11/14
Reviewed by:	Daniel Noon	~~Shan Burson~~ Daniel Noon	Wilderness Coordinator Acting	2/11/14
Approved by:		Kevin Schneider	Acting Superintendent	2/11/14

APPENDIX B. CULTURAL RESOURCES AREA OF POTENTIAL EFFECT

The Jenny Lake Renewal Plan/EA includes approximately 11.5 acres of ground disturbance. Nine and one-half acres are located in the frontcountry while around 2 acres are located in the backcountry. The 11.5 acres of ground disturbance are encompassed by the larger 305-acre Area of Potential Effects (APE), which captures the full geographic extent of the undertaking, including all ground disturbance and all areas with visible, audible, and atmospheric effects. Project APEs are shown on the following figures.




Grand Teton National Park
John D. Rockefeller Jr. Memorial Parkway
National Park Service
U.S. Department of the Interior
Jenny Lake Renewal Project: Jenny Lake Overlook APE
N
Legend
Jenny Lake Overlook Ground Disturbance
Overlook_APE
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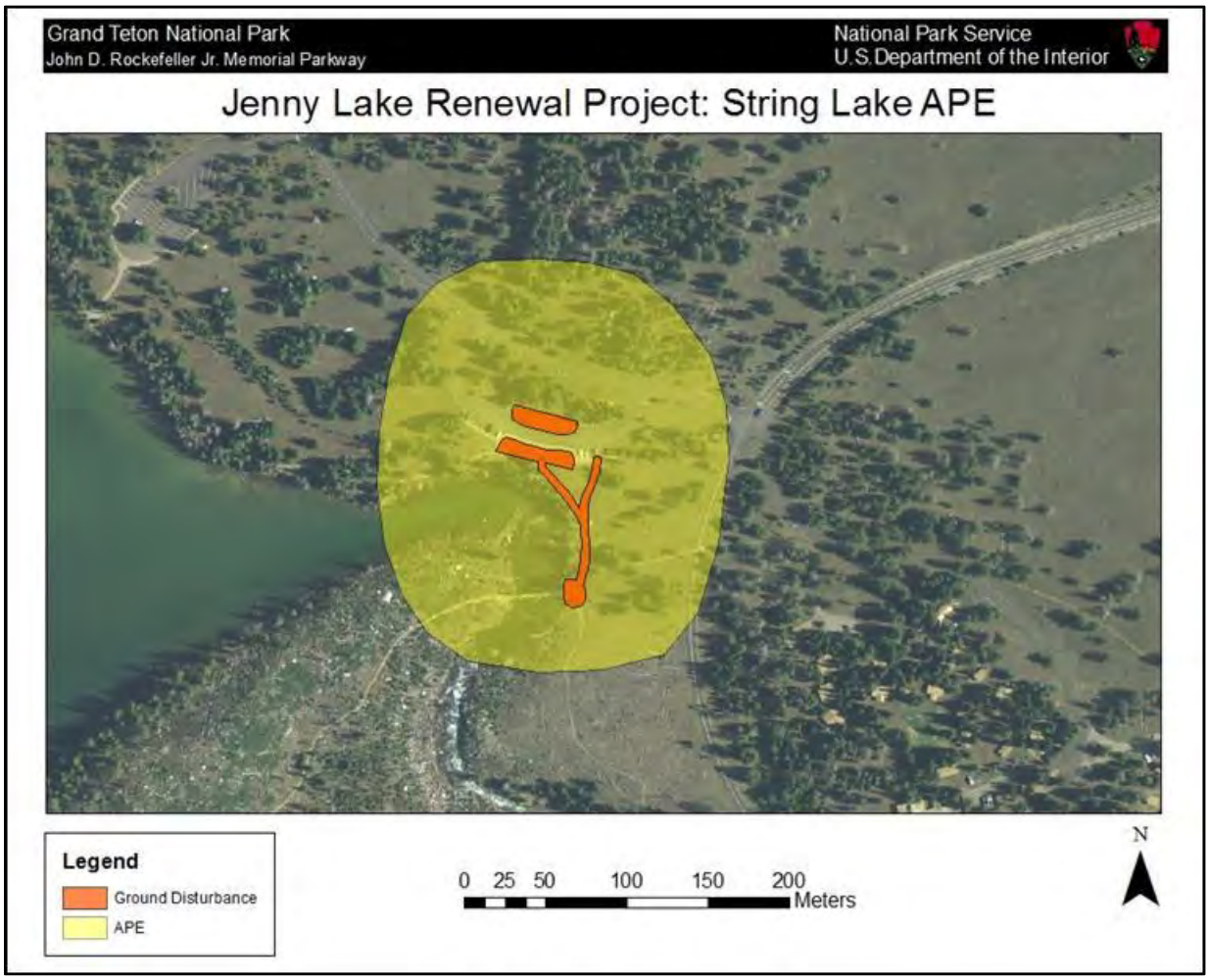
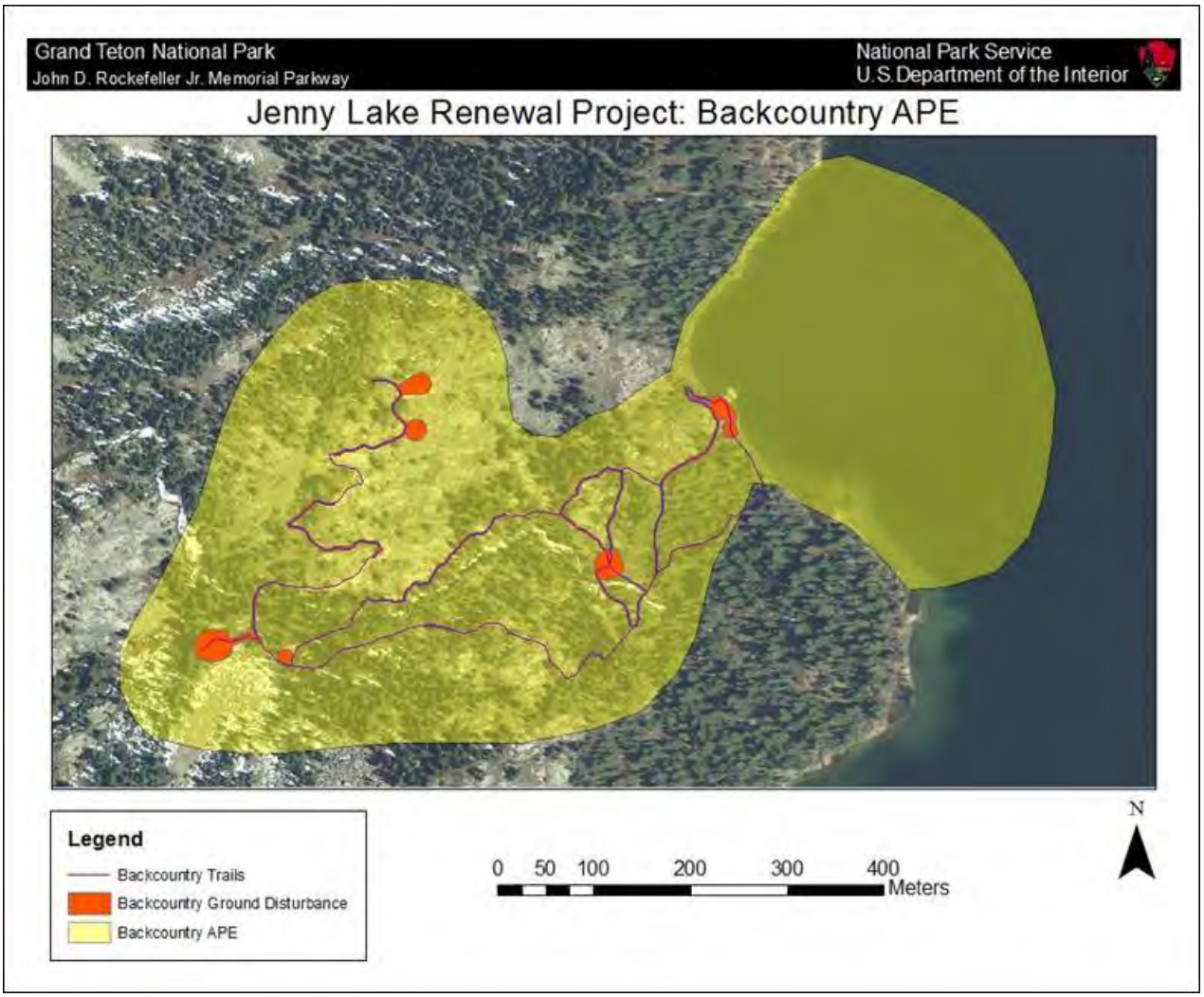
Meters


Grand Teton National Park
John D. Rockefeller Jr. Memorial Parkway
National Park Service
U.S. Department of the Interior
Jenny Lake Renewal Project: String Lake APE
Legend
Ground Disturbance
APE
0 25 50 100 150 200
Meters
N


Grand Teton National Park
John D. Rockefeller Jr. Memorial Parkway
National Park Service
U.S. Department of the Interior
Jenny Lake Renewal Project: Backcountry APE
Legend
Backcountry Trails
Backcountry Ground Disturbance
Backcountry APE
0 50 100 200 300 400
Meters
N

APPENDIX C. WILDLIFE INFORMATION

On Jenny Lake, a variety of waterfowl may be seen such as Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), Barrow's goldeneye (*Bucephala islandica*), and common merganser (*Mergus merganser*). In the lodgepole pine forest that bounds the project area to the west, common birds include olive-sided flycatcher (*Contopus cooperi*), yellow-rumped warbler (*Dendroica coronata*), Steller's jay (*Cyanocitta stelleri*), ruby-crowned kinglet (*Regulus calendula*), mountain chickadee (*Poecile gambeli*), white-crowned sparrow (*Zonotrichia leucophrys*), chipping sparrow (*Spizella passerine*), red-breasted nuthatch (*Sitta canadensis*), pine siskin (*Carduelis pinus*), red crossbill (*Loxia curvirostra*), and dark-eyed junco (*Junco hyemalis*). Local raptors commonly observed in lodgepole pine forests and sagebrush-grasslands in and around Jenny Lake include red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), common raven (*Corvus corax*), great-horned owl (*Bubo virginianus*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), and rough-legged hawk (*Buteo lagopus*) (in the winter). Other common birds in the area include gray jay (*Perisoreus canadensis*), barn swallow (*Hirundo rustica*), and mountain bluebird (*Sialia currucoides*).

Species more closely linked to sagebrush-grasslands include the green-tailed towhee (*Pipilo chlorurus*), Brewer's sparrow (*Spizella breweri*), and sage sparrow (*Amphispiza belli*). Non-migratory species include the hairy and downy woodpeckers (*Picoides villosus* and *P. pubescens*), and black-billed magpie (*Pica hudsonia*).

Mammals that commonly use the project area and surroundings include mule deer (*Odocoileus hemionus*), elk (*Cervus Canadensis*), moose (*Alces alces*), and pronghorn (*Antilocapra americana*). Evidence of moose, mule deer, and elk use has been observed along the southwest trail. Black bears (*Ursus americanus*) are common in the vicinity of Jenny Lake and use portions of the project area for resting, feeding, and travel. Coyotes (*Canis latrans*) are frequently observed in the sagebrush communities, and mountain lion (*Felis concolor*), red fox (*Vulpes vulpes*), gray wolf (*Canis lupus*), and bobcat (*Felis rufus*) may also be present in the project area and surroundings, especially outside of the tourist season. Porcupine (*Erethizon dorsatum*), Uinta ground squirrel (*Urocitellus armatus*), red squirrel (*Tamiasciurus hudsonicus*), pocket gopher (*Thomomys talpoides*), chipmunk (*Eutamias umbrinus*), and vole (*Microtus pennsylvanicus*), are common in the vicinity of the project area.

Common bat species in the park include the little brown bat (*Myotis lucifugus*) and big brown bat (*Eptesicus fuscus*). Both of these species roost colonially, often in buildings, and may use portions of the Jenny Lake project area for foraging and roosting.

Common amphibians present in the project area include western chorus frog (*Pseudacris triseriata*) and blotched tiger salamander (*Ambystoma tigrinum melanostictum*). Three snake species that typically occur near areas of water may be present in the project area; of these, wandering gartersnake (*Thamnophis elegans vagrans*) is most likely to be observed, while valley gartersnake (*Thamnophis sirtalis fitchi*) and rubber boa (*Charina bottae*) would be observed less frequently.

Native cutthroat trout (*Oncorhynchus clarkii*) occupy both Jenny Lake and Cascade Creek. Below Hidden Falls, the creek contains native mottled sculpin (*Cottus bairdii*) a nongame fish, and possibly redside shiner (*Richardsonius balteatus*). Nonnative brook trout (*Salvelinus fontinalis*) occupy both Cascade Creek and Jenny Lake. The lake also hosts native mountain whitefish (*Prosopium williamsoni*), Utah sucker (*Catostomus ardens*), Utah chub (*Gila atraria*),

mottled sculpin, redside shiner, speckled dace (*Rhinichthys osculus*), and non-native lake trout (*Salvelinus namaycush*).

Canada Lynx. The Canada lynx (*Lynx canadensis*) is listed as a federally threatened species (65 FR 16051). Lynx are known to use boreal and montane forests and are considered rare in the Greater Yellowstone Area. Lynx are solitary carnivores generally occurring at low densities in boreal forest habitats, with their distribution and abundance closely tied to that of their primary prey, the snowshoe hare (*Lepus americanus*). However, this relationship may be muted or absent in more southern populations (Halfpenny et al. 1982). In Wyoming, lynx occur primarily in spruce/fir and lodgepole pine forests with slopes of 8 to 12 degrees and at elevations from around 8,000 feet to 9,600 feet (Ruediger et al. 2000). However, aspen stands and forest edges may also be important. Critical habitat has been designated for this species and potential habitat areas within Grand Teton National Park have also been identified based on general habitat preferences. There is no designated critical habitat within the project area.

Information on lynx abundance and distribution within Grand Teton National Park is limited. Historical locations of lynx have been documented within the park (Reeve et al. 1986, McKelvey et al. 2000), and more recent sightings and DNA detections have confirmed the continued occurrence of lynx in and adjacent to the park (Squires and Laurion 2000; Squires and Oakleaf 2005; Murphy et al. 2006; Holmes and Berg 2009). During the winter of 2007-2008, researchers documented lynx tracks in the Arizona Creek drainage near the park and in the Colter Bay area (NPS 2012a). Lynx tracks were detected on 10 occasions in the winter of 2008-2009 in the Togwotee Pass area (Holmes and Berg 2009). Identified lynx tracks included an area just east of the park boundary in the Spread Creek drainage. Radio-collared lynx from Colorado have been documented passing through the Teton Range and in the Togwotee Pass area. Whether any of the lynx recently detected are residents or transients, or if lynx currently reside in Grand Teton National Park, is unknown. Observation data suggest that lynx could be present in the park, but if they are, they occur at very low densities, and may only be present as transients moving to and from larger blocks of more favorable habitat.

Based on general habitat preferences and existing vegetative cover types, potential habitat for Canada lynx is present in the park. The elevation of the Jenny Lake project area is around 6,800 feet and is within the range considered suitable for lynx in the western U.S. (Ruediger et al. 2000). Potential den sites are limited in the project area due to stand characteristics and proximity to human habitation and disturbance. Lynx may move through the project area en route to more suitable habitat.

Grizzly Bear. The grizzly bear (*Ursus arctos horribilis*) was listed as an endangered species in 1967 and subsequently reclassified as threatened in 1975 (40 FR 31734). On March 29, 2007, the USFWS removed the Yellowstone Distinct Population Segment of grizzly bears from the Federal List of Threatened and Endangered Wildlife (72 FR 14866), but on September 21, 2009, the Federal District Court in Missoula, Montana issued an order enjoining and vacating the delisting of the Greater Yellowstone Area grizzly population. This was upheld by the 5th Circuit Court of Appeals in November 2011.

Grizzly bear management within Grand Teton National Park is governed by the park's Human-Bear Management Plan (NPS 1989) and the Interagency Grizzly Bear Guidelines (Interagency Grizzly Bear Committee 1986). The guidelines were developed in an effort to provide effective direction for the conservation of grizzly bears and their habitat among the federal agencies

responsible for managing land within the recovery zone. The Interagency Grizzly Bear Committee subsequently approved the application of the guidelines on federal lands throughout grizzly bear ecosystems in Idaho, Montana, and Wyoming. Specifically, the park's objectives for managing grizzly bears are to:

- Restore and maintain the natural integrity, distribution, and behavior of grizzly bears;
- Provide for visitors to understand, observe, and appreciate grizzly bears; and,
- Provide for visitor safety by minimizing bear/human conflicts, by reducing human-generated food sources, and by regulating visitor distribution.

Management of grizzly bears in Grand Teton National Park under these programs has been highly successful in promoting grizzly bear recovery and reducing bear-human conflicts and human-caused bear mortalities.

Grizzlies are relatively common in the southern Greater Yellowstone Area, and the northern portion of Grand Teton National Park falls within the grizzly bear recovery zone, primary conservation area. The Jenny Lake area is not included in this zone, but is considered occupied grizzly bear habitat. Grizzly bears are now common in the Gros Ventre Mountains on the southeastern border of Grand Teton National Park, and southeast to the upper Green River basin. In the Teton Range, grizzly bears are regularly sighted north of Leigh Canyon and the Badger Creek drainage, where visitor use of the backcountry occurs at relatively low levels, as well as throughout the entire park along the valley floor including around Jenny Lake.

Grizzly bears have large home ranges (50 to 300 square miles for females; 200 to 500 square miles or more for males), encompassing diverse forests interspersed with moist meadows and grasslands in or near mountains (NPS 2006). Bears feed on a variety of food, depending on seasonal availability. In general, whitebark pine nuts, graminoids, and hoofed animals (also called ungulates) are the most important foods in the grizzly bear's diet, but fish, small mammals, herbaceous vegetation, tubers, fruit, and insects also comprise a portion of their diet (Mattson and Knight 1991). Ungulate carcasses are an important high quality food source for bears (Mattson 1997) and will often attract and keep bears in localized areas for periods of several days to a week or more.

The greatest threat to grizzly bears is human-caused mortality. Although the number of human-habituated (but not food-conditioned) grizzlies in the park has increased in recent years (NPS 2010), park staff have been highly successful in promoting grizzly bear recovery and reducing bear-human conflicts (e.g., property damage, incidents of bears obtaining human food, and bear-inflicted injuries to humans) as well as human-caused bear mortalities. Recreational and administrative facilities, human activities, and human waste (garbage and sewage) in the park, including the Jenny Lake project area, are managed in a manner that results in few human-bear incidents.

North American Wolverine. On February 4, 2013 the USFWS proposed to list the distinct population segment of the North American wolverine (*Gulo gulo luscus*) occurring in the contiguous United States as threatened under the ESA (78 FR 7863). Previously (December 2010) the North American wolverine had been designated a candidate species. Persistent, stable snow is strongly tied to wolverine habitat suitability and appears to be a requirement for natal denning because it provides security for offspring and buffers against cold temperatures. Wolverines are highly territorial and naturally occur at very low densities because of their large

spatial requirements. They are opportunistic feeders that consume a variety of foods, depending on availability. They primarily scavenge carrion, using an excellent sense of smell to find food beneath deep snow, but they also prey on small animals and birds, and feed on fruits, berries, and insects.

In the Rocky Mountain states where they typically prefer high elevations and rugged and snowy terrain, the known breeding range of wolverines reaches its southernmost extent in Grand Teton National Park. In the Yellowstone region, where wolverines occur at a density of less than one per 100 square miles, recent research has revealed that just two breeding females and two breeding male wolverines occupy the entire Teton Range. Because of such low densities, the search for a mate and breeding territory requires covering long distances, sometimes traveling hundreds of miles, crossing low-elevation valleys between mountain ranges in the process.

In the park a few wolverine sightings are reported annually; they are most common in the Teton canyons and high elevations (J. Stephenson, personal communication), but several observations are documented in low elevation areas similar to and adjacent to the project area. These include observations at Leigh Lake, in the Pacific Creek subdivision on the park's east border, and along the Snake River at Deadman's Bar, Pacific Creek, Oxbow Bend, and Flagg Ranch.

Greater Sage-grouse. In March 2010, the greater sage-grouse (*Centrocercus urophasianus*) was listed by the USFWS as a candidate species (75 FR 13910). State and local working groups have initiated conservation planning efforts that focus on providing guidelines for sustaining and/or perpetuating sage-grouse populations through consistent and up to date management strategies. The Wyoming Greater Sage-Grouse Conservation Plan (WGFD 2003) outlines these guidelines for Wyoming. In addition, the Upper Snake River Sage-Grouse Working Group has developed a conservation plan that outlines recommendations for grouse management and conservation in the Jackson Hole area.

Threats to the greater sage-grouse include habitat removal and fragmentation (USFWS 2012). This species is highly dependent on sagebrush for habitat and forage. Sagebrush communities are found on the uplands around Jenny Lake and adjacent to the project area. In an attempt to preserve areas designated as core sage-grouse areas, habitat conservation strategies are being implemented by federal and state agencies and local governments to forestall a future listing of the species. Any developments or ground disturbance activities permitted in these corridors should comply with core area management guidelines (State of Wyoming EO 2011-5). The project area is not in a core sage-grouse habitat area but is adjacent to one located primarily to the east of Jenny Lake. Portions of the project area contain sagebrush habitats that are marginally suitable for the greater sage-grouse; however, due to human activity in the project area it is anticipated that the area receives little to no use by this species.

Yellow-billed Cuckoo. The yellow-billed cuckoo (*Coccyzus americanus*) was listed by the USFWS as a candidate species in July 2001 (66 FR 38611). This species in the western portion of the U.S. was proposed as threatened on October 3, 2013 (78 FR 61621), and the comment period was extended through February 24, 2014 (78 FR 78321) in December 2013. This species breeds in dense willow and cottonwood stands in riparian areas and river floodplains. Threats to the yellow-billed cuckoo include loss of riparian habitat, often attributed to agriculture, dams, river flow management, overgrazing, and non-native plant species.

Yellow-billed cuckoos are very sensitive to disturbance in the form of habitat modification and loss. In recent years, cuckoo distribution in the west has been reduced considerably. Biologists

estimate that more than 90 percent of the bird's riparian habitat has been lost or degraded as a result of human disturbance. Cuckoos are also sensitive to human presence and may abandon their nest if disturbed, especially during the nest building stage (Laymon 1998). In Grand Teton National Park, there are two unverified reports of yellow-billed cuckoos from June 1985 and July 1992, and one confirmed observation from July 2000. However, Grand Teton is outside the historical breeding range of the species, and the riparian habitat in the park, which is all above 6,300 feet, does not constitute suitable breeding habitat.

Gray Wolf. Gray wolf (*Canis lupus*) is another large mammal that may use habitat within the Jenny Lake area of Grand Teton National Park. The USFWS considers it a species of special concern in Teton County, Wyoming. Gray wolves are habitat generalists that occupy a broad range of habitats including coniferous forests, montane meadows, and shrub steppe; therefore, most of Grand Teton National Park is considered suitable habitat for gray wolves. Depending upon prey distribution and abundance, wolves in Grand Teton National Park may occupy grasslands, sagebrush steppes, coniferous and mixed forests, and sub-alpine areas. Key components of suitable habitat include sufficient year-round prey base of ungulates and alternate prey, suitable and semi-secluded denning and rendezvous sites, and sufficient space with minimal exposure to humans. Wolves travel widely and are relatively tolerant of human presence, except while raising young near den and rendezvous sites. Wolf pups are born in mid-April to May, and packs use rendezvous sites into the fall. The project area is within the range of elk, deer, and moose, which are all considered preferred prey species of wolves, and elk, the principal prey species of wolves in the area, are abundant in the area around Jenny Lake. Territories of two to three wolf packs overlap the project area. In summary, wolves are expected to be occasional visitors to the project area where preferred prey species are common.

Sagebrush Habitat Species. Sagebrush habitat in the park, including the southern extent of the project area, provides habitat for seven special-concern species, including six birds and one mammal (Table 7 in the EA). The project area contains suitable to marginal sagebrush habitat for all seven special concern species, in areas of mature vegetation along the south and east side of Jenny Lake. Sagebrush habitat also occurs along U.S. Highway 26/89/191, east of the project area. Two bird species, the Brewer's sparrow and sage thrasher, are sagebrush obligates, depending exclusively or primarily on sagebrush habitats for breeding and nesting. The habitats that occur in the project areas are marginally suitable for these species because of the amount of forested habitat present. Long-billed curlew is not expected to be present in the sagebrush habitat in the project area because it requires more expansive, open, level to gently sloping or rolling grasslands with short vegetation such as short grass or recently grazed mixed-grass prairie. Population declines of the sagebrush obligate and other species have occurred throughout their ranges because of habitat loss. Therefore, all of these are assigned a native species status of 3 or 4 because populations are declining and their habitat is vulnerable.

Forest Species. Thirteen special-concern species, including three birds and 10 mammals, primarily inhabit forest habitats (Table 7 in the EA). All of these species have the potential to occur in the project area. Forest habitat dominates the area along the southwest trail and trails leading up to Hidden Falls and Inspiration Point, located in the western portion of the project area, as well as in the Jenny Lake Overlook area on the eastern portion of the project area. The southern portion of the project area also has scattered forested habitat intermixed with sagebrush habitat. Moose are known to be present in the area surrounding Jenny Lake and it is possible, but unlikely, that bighorn sheep would be found in the project area.

The birds are all classified as native species status 4, while the mammals include more vulnerable classifications of 2 or 3. The vagrant shrew is of concern because populations are restricted in numbers and its habitat is vulnerable. The goshawk and owls are under stress because of habitat degradation and continued habitat vulnerability. For all three bird species, their population status and trends in Wyoming are poorly understood and habitat needs are not well defined (WGFD 2005).

The six bat species would likely use the forested habitat within the project area for roosting and foraging habitat. These species have experienced declines caused by habitat loss, habitat degradation, disturbances or conflicts with humans, and loss of prey (WGFD 2005). An additional concern for these species is their susceptibility to a fungus identified as white-nose syndrome, which is migrating toward the state. A strategic plan for their management with regard to this fungus has been prepared by the WGFD (WGFD 2011) with cooperation from the NPS and others. It outlines Wyoming's focus as gathering baseline data, detecting new occurrences of white-nose syndrome, and preventing its spread into the state.

Talus Slope Species. American pika (*Ochotona princeps*) is classified as NSSU (U), Tier II in Wyoming (WGFD 2010). Pika is considered an indicator species for detecting ecological effects of climate change. Results from recent studies suggest that in some areas pika habitat at low elevation is being reduced due to increased temperatures (Beever et al. 2013). Pika inhabit talus slopes with varying densities of vegetation throughout the Teton Range. Pika are common in the project area, which contains important, high quality habitat.

In 2009, Grand Teton joined seven other national parks and university scientists on a collaborative research project called Pikas in Peril. The goals of the group were to 1) Document pika occurrence patterns and predict distribution across eight park units; 2) Measure gene flow and model connectivity of pika populations within five park units including Grand Teton; 3) Project climate change effects on the future distribution, connectivity, and vulnerability of pika populations in each park unit; and 4) Develop information materials for the public and increase awareness about climate impacts to our parks and resources (Wolff 2010).

Using data collected in Grand Teton from 2010-2012, members of the Pikas in Peril group analyzed the potential impacts of harvesting rocks from select locations in the Jenny Lake trails project area on the park's pika population (Epps et al. 2013). The results suggested a need for careful monitoring of pika "given that 1) The impacts of such disturbance on pika are not well understood; 2) Pikas in the area exhibit a unique genetic signature; 3) The area shows signs of isolation from other pika habitat; and 4) The affected area represents high quality habitat in an important, low elevation setting." The authors encourage managers to minimize the intensity, duration, and area of disturbance. They further recommend that pika surveys be conducted in advance of any removal of rocks from the project area to guide the final decisions of where and if rock harvesting occurs, and to avoid taking rocks from areas of high concentration of pika activity (Epps et al. 2013). In accordance with recommendations outlined by Epps et al. (2013), park staff is coordinating efforts to harvest rocks from the project area while attempting to avoid impacts and disturbance to pika.

Riparian, River, and Wetland Species. There are two amphibian and two reptile species of concern that occur in wet habitats that may be present in the project area. Boreal toads may be present in the Jenny Lake area and are anticipated to occur along the banks and tributaries to Jenny Lake. It is highly likely that spotted frogs are present in the project area, particularly along

the lakeshore and streams (Greater Yellowstone Science Learning Center 2013). Northern leopard frogs were historically present but there have been no verified sightings in the park in nearly 40 years. It is assumed that this species is extremely rare or absent from the area (NPS 2010). Valley gartersnake and northern rubber boa both may be present in the project area.

The water vole is designated a native species status 3 because populations are restricted in distribution and its habitat is vulnerable (WGFD 2005). The water vole inhabits moist, subalpine and alpine meadows within about 50 feet of narrow, low-gradient streams. Therefore, its presence in the project area is unlikely.

Trumpeter swans use riparian areas such as lakes, ponds, rivers, and reservoirs for nesting and foraging. They initiate nesting when these areas thaw, typically in late April or early May. Eggs hatch in early June and the young usually fledge in September. Swans use open water along rivers and lakes for foraging in the late fall and winter and are likely to be seen at Jenny Lake although there is no known nesting at Jenny Lake or within the project area (J. Stephenson, personal communication). Throughout the year, swans use the Snake River near the Teton Park Road bridge at Moose, Gros Ventre River corridor, and open-water area at the Flat Creek wildlife viewing area east of U.S. Highway 26/89/191 for foraging and loafing.

The bald eagle was federally listed as an endangered species in 1967. After several decades of protection, recovery goals were met and bald eagles were delisted in 2007. They remain protected under the 1918 Migratory Bird Treaty Act and the 1940 Bald and Golden Eagle Protection Act. Eagles occur year-round in the park, particularly along the river corridors. As of 2012, the park contains 16 nesting bald eagle territories (J. Stephenson, personal communication) but not all nests are active and fledge young each year. All territories are monitored for activity by the NPS. The nearest known bald eagle nest is located near Cottonwood Creek north of the 4 Lazy F Ranch, which is approximately 5 miles from the project area (Wolff 2010). In the park, half-mile radius protective closures are established around active bald eagle nests annually from February 15 to August 15 (NPS 2011).