

National Park Service  
U.S. Department of the Interior

## Lake Chelan National Recreation Area



## Replacement of Administrative Facilities at Stehekin Environmental Assessment

North Cascades National Park Service Complex  
Lake Chelan National Recreation Area  
November 2014

# How to Comment on this Environmental Assessment

You may submit your comments by any of the following methods:

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# ABBREVIATIONS AND ACRONYMS

ABA	Architectural Barriers Act
ADA	Americans with Disabilities Act
ajc	ajc architects
APE	Area of Potential Effect
BEA	U.S. Bureau of Economic Analysis
BMP	Best Management Practice
CAA	Clean Air Act
CBA	Choosing by Advantages
CCD	Census County Division
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMZ	Channel Migration Zone
Corps	U.S. Army Corps of Engineers
DAHP	Department of Archeology and Historic Preservation
dbh	diameter at breast height
DCA	Designated Conservation Area
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FFRA	Forest Fuel Reduction Area
FR	Federal Register
GIS	Geographic Information System
GHG	greenhouse gas
GMP	General Management Plan
HCP	habitat conservation plan
HPA	Hydraulic Project Approval
IPM	Integrated Pest Management
ISWAP	Integrated Solid Waste Alternatives Plan
JARPA	Joint Aquatic Resources Permit Application
JHD	Jurisdictional Health Departments
LEED	Leadership in Energy and Environmental Design
LUST	leaking underground storage tank
MHHW	mean higher high water
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOCA	North Cascades National Park
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
NRHP	National Register of Historic Places
OHWM	ordinary high water mark
PUD	Public Utility District
RCW	Revised Code of Washington
SHPO	State Historic Preservation Officer

SRCIP	Stehekin River Corridor Implementation Plan
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
VA	Value Analysis
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WNHP	Washington Natural Heritage Program
WSDOT	Washington State Department of Transportation

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# CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

## 1.1 PURPOSE AND NEED

The Lake Chelan National Recreation Area (NRA) is proposing a project to remove solid waste collection, employee housing, and maintenance activities from their regulatory floodplains and outside of the Stehekin River Channel Migration Zone (CMZ) in accordance with previous planning documents (e.g., 1995 General Management Plan [GMP]) and to provide necessary housing and facilities for efficient park management. This Environmental Assessment (EA) presents three action alternatives that would execute this proposal in different ways and allows the public the opportunity to comment on how each alternative would affect the natural, historic, and built environment. The National Park Service (NPS) will consider comments received on this document to determine which alternative to pursue.

This action was evaluated programmatically in the 2012 Final Environmental Impact Statement (EIS) for the Stehekin River Corridor Implementation Plan (SRCIP) (NPS 2012a). This EA tiers off of the 2012 EIS and fulfills the direction provided in the SRCIP Record of Decision to develop site-specific environmental analysis for relocation and replacement of the maintenance facility, fire cache, and one three-bedroom employee housing unit.

### 1.1.1 PURPOSE OF THE ACTION

The purpose of the proposed action within the Lake Chelan NRA is to provide essential, cost-effective, and sustainable facilities for maintenance, fire operations, solid waste management, and staff housing outside of environmentally sensitive areas, including areas subject to flooding and in areas at lower risk for geohazards.

### 1.1.2 NEED FOR THE ACTION

This action is needed because:

- Existing park facilities are located within the Stehekin River's CMZ, as well as its 100- and 500-year regulatory floodplains. NPS facilities in the floodplain not only experience flood-related damage, but also adversely affect the natural characteristics of the floodplain, including the CMZ. Additionally, current storage of solid waste and hazardous materials within the 500-year floodplain and location of aging septic systems within the 100-year floodplain threaten public health and safety and natural resources. The park must comply with Executive Order 11988 (Floodplain Management) (42 FR [Federal Register] 26951, 3 CFR [Code of Federal Regulations]), which "requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (Federal Emergency Management Agency [FEMA] n.d.).
- Existing employee housing, solid waste facilities, park maintenance facilities, and infrastructure are inefficient to operate because many of these facilities are in poor condition and were designed for purposes other than their current use.



Flood conditions at existing park facilities.

- The maintenance compound facilities within the park, including hazardous waste storage and solid waste operations, were built between the 1940s and 1980s and have far exceeded their useful life.
- Given the total cost of facility ownership, i.e., the cost of both constructing and operating/maintaining a facility over its design lifespan, consolidating widespread isolated facilities and designing/constructing them for financially and environmentally sustainable operations would be less expensive than continuing to operate and maintain existing facilities and infrastructure.
- In 1977, the NPS closed the Stehekin dump to comply with federal law. NPS and the Stehekin community had no alternative for solid waste disposal, so the NPS began operating a solid waste recycling, compaction, and transfer facility to handle NPS waste and waste from the Stehekin community, deter proliferation of small dumps on private lands, and prevent illegal dumping on public land. In 1994, NPS enacted solid waste regulations for all units of the NPS system, which prohibited accepting solid waste from sources other than NPS beginning in 1996. Since then, the NPS has continued to collect solid waste from the Stehekin community in spite of the regulation prohibiting this practice. The NPS is currently pursuing a regulatory change that would authorize the continued collection of solid waste from the Stehekin community because this service remains essential.
- The Stehekin community private businesses generate 23.5% and residents generate 34.6% of all waste produced in Lake Chelan NRA, and disposing of this waste costs approximately \$54,000 per year (NPS 2012a). This cost is subsidized entirely by the operating budget for Lake Chelan NRA. The NPS cannot continue to subsidize this service. Options for cost recovery need to be explored with Chelan County and the residents and businesses of Stehekin.

### **1.1.3 DECISION TO BE MADE**

This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations (40 CFR Parts 1500-1508); NPS Director's Order 12 (Conservation Planning, Environmental Impact Analysis, and Decision-making) (NPS 2000a) and handbook; Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, and its implementing regulations (36 CFR Part 800); related guidance; and applicable executive orders.

NEPA requires the documentation and evaluation of potential impacts resulting from federal actions on lands under federal jurisdiction. An EA discloses the potential environmental consequences of implementing the proposed action and other reasonable and feasible alternatives. NEPA is intended to provide decision makers with sound knowledge of the environmental consequences of the alternatives available to them.

This decision focuses on selecting an alternative that best achieves the purpose, need, and objectives of the proposal while minimizing and mitigating impacts on the resources and values of the Lake Chelan NRA. Through the 1995 Lake Chelan NRA GMP, and recently affirmed by the Stehekin River Corridor Implementation Plan, the NPS has already decided to move the maintenance facility from its current location to a safer, more sustainable location adjacent to the Stehekin Airstrip. The decision to be made now involves:

- what specific maintenance facilities would be constructed (fire operations, solid waste operations, administration, etc.) and where they would be located in that area;
- where to construct one single-family three-bedroom residence for NPS staff;
- how to improve solid waste management within Stehekin, including how the NPS would coordinate with Chelan County to receive and dispose of solid waste from NPS and non-NPS generators.

The superintendent of North Cascades NPS Complex will be the recommending official. The Regional Director, NPS Pacific West Region, will be the deciding official.

#### **1.1.4 DECISIONS BEYOND THE SCOPE OF THIS EA**

This EA includes an analysis of the potential effects associated with a proposed special regulation that would enable the NPS to continue to accept solid waste generated by non-NPS activities and allow a new solid waste transfer station to be sited in a more environmentally suitable location within Lake Chelan NRA. This special, unit-specific regulation is needed because solid waste disposal regulations (36 CFR Part 6) for the NPS prohibit the agency from accepting solid waste generated by non-NPS activities in all units of the NPS, including Lake Chelan NRA.

The agency-wide regulation prohibiting acceptance of solid waste from non-NPS generators was promulgated in 1994 (and became effective in 1995) to ensure that both existing and new solid waste disposal sites within the boundary of any unit of the National Park System would not degrade the natural or cultural resources of the park unit. Under these regulations, the solid waste transfer station in Stehekin meets the definition of “solid waste disposal site” and is therefore subject to the requirements of 36 CFR Part 6, including the requirement that solid waste handled by the site must be generated solely from NPS activities. Since 1996, Lake Chelan NRA has been out of compliance with regulations by accepting solid waste from the broader Stehekin community.

The NPS proposes to promulgate a special regulation authorizing the disposal of waste generated by non-NPS activities because the geographically remote area presently lacks waste disposal services provided by Chelan County or private parties. Lack of waste disposal services precludes private residents and businesses in Stehekin from reasonably disposing of solid waste elsewhere in the area. The NPS believes that the lack of feasible alternatives for solid waste disposal would result in trash burning, dumping, and other unacceptable nuisances for Lake Chelan NRA and the Stehekin community.

This EA includes an analysis of the potential environmental and economic effects of the proposed rule in order to satisfy the administrative procedures for promulgating a regulation, which include disclosure of environmental effects in accordance with NEPA. While the decision of whether and where to locate a new solid waste facility will be made through this EA, the authority to accept waste generated by non-NPS activities at the existing or any new facility will be addressed through the rulemaking process.

#### **1.1.5 OBJECTIVES IN TAKING ACTION**

All alternatives selected for detailed analysis must meet all objectives to a large degree, and they must resolve the purpose of and need for action. Objectives for this action must be grounded in the park’s enabling legislation, purpose, and significance, and they must be compatible with direction and guidance provided by the 1995 Lake Chelan NRA GMP. With this guidance in mind, the following objectives were developed for this action:

- enhance the ecological integrity of the Stehekin River by removing NPS infrastructure and facilities from the CMZ and restoring the vacated areas
- provide low-maintenance, sustainable facilities to support efficient park management and operations
- reduce the park’s energy use by designing and building facilities that are energy efficient
- minimize adverse impacts on park resources
- reduce the park’s maintenance backlog
- create architectural designs that are in harmony and continuity with the Stehekin Valley’s traditional character and style, scale and orientation, color, and texture of exterior surfaces
- minimize the solid waste stream, improve efficiency, and implement cost recovery for solid waste transfer service
- when practical, ensure development densities comport with zoning requirements for adjacent private land



### 1.1.6 PROJECT VICINITY

Lake Chelan NRA is one of three NPS units managed as part of the North Cascades NPS Complex in north central Washington State (Figure 1). Encompassing close to 63,000 acres of land, Lake Chelan NRA includes approximately the upper five miles of Lake Chelan and the lower nine miles of the Stehekin River. At 1,450 feet, Lake Chelan is the third deepest lake in North America. The Stehekin River flows into Lake Chelan, a major tourist attraction within the NRA. Approximately 90% of Lake Chelan NRA (56,000 acres) is included within the Stephen Mather Wilderness Area (NPS 2012a). Lake Chelan NRA includes the community of Stehekin, a small town with approximately 60-90 year-round residents, with those numbers increasing by 80 people during the summer.

Figure 1: Project Area



The Stehekin Valley is a glacial valley that begins at the crest of the Cascade Range near Cascade Pass (North Cascades National Park [NOCA]) and ends where the river flows into Lake Chelan. The developed lower valley is remarkable for the rapid change in river pattern within seven miles, from boulder-strewn gravel bars at McGregor Meadows to sandbars at the lake edge. As the largest tributary to Lake Chelan, the Stehekin River watershed encompasses 344 square miles.



Stehekin Valley.

No roads lead into Lake Chelan NRA. Accessible only by foot, boat, or plane, the Stehekin area includes a marina, visitor center, campgrounds, concessioner-operated lodging, food service, general store, shuttle/tour operations, and boat/bike rental services. Ferry service is provided from the south end of Lake Chelan near the town of Chelan. The area can be accessed on foot via hiking trails through the Cascade Range during the summer months.

The project area is located within the lower five miles of the Stehekin Valley, between the Landing and the airstrip. Most of the development in the valley is focused within this lower portion of the valley.

### 1.1.7 PURPOSE AND SIGNIFICANCE OF LAKE CHELAN NATIONAL RECREATION AREA

#### 1.1.7.1 Purpose

The purpose of Lake Chelan NRA is to “...complement North Cascades National Park and conserve the scenic, natural and cultural values of the Lower Stehekin Valley, Lake Chelan and surrounding wilderness, while respecting the remote Stehekin community, for outdoor recreation and education” (NPS 2012b). Today, Lake Chelan NRA functions as a gateway to more than two million acres of roadless wilderness.

#### 1.1.7.2 Significance

The following statements from the North Cascades NPS Complex *Foundation Document* (NPS 2012b) are those that apply specifically to Lake Chelan NRA.

- Within Lake Chelan NRA, Stehekin is a private community that provides visitors with an opportunity to see and experience life in a remote setting that is not accessible by roads and is surrounded by wilderness.
- Set in a glacier-carved trough between steep valley walls, Lake Chelan is the nation’s third deepest lake. Fed by glacial melt and the Stehekin River, it is known for its exceptionally cold and clear water.
- Lake Chelan NRA provides a spectrum of recreational opportunities that transition from highly mechanized to primitive as one moves from the lake, up the Stehekin Valley, and into the wilderness.

Management Objectives for Lake Chelan NRA include:

- **Natural Resource Management:** Manage Lake Chelan NRA as an integral part of a larger regional ecosystem, and protect and restore the components and processes of naturally evolving park ecosystems, including the natural abundance, biodiversity, and ecological integrity of plants, animals, water, and soil to the extent public safety considerations permit (NPS 1995).
- **Cultural Resource Management:** Protect and interpret the park’s archeological, historic, and ethnographic resources. Treatment of historic properties would be undertaken in accordance with NPS policies and the park’s cultural resource management plan in consultation with the

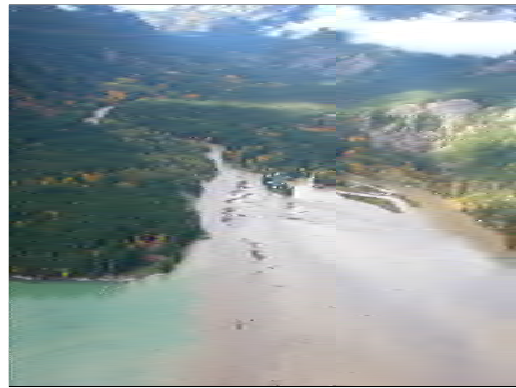
Washington State Historic Preservation Officer, the Advisory Council on Historic Preservation, and other interested persons as appropriate under 36 CFR 800... (NPS 1995).

- **Visitor Experience:** Emphasize selected opportunities that focus on natural, cultural, and recreational values, through both structured and unstructured ways and both solitary and social means. Visitors encounter facilities and services in a rural Stehekin community context where needs are balanced with preservation of a nearly pristine natural environment (NPS 1995).
- **Land Use and Development, *Stehekin Landing and Airstrip Area Development Concept Plans Elements*:** Preserve the rural setting through sustainable design for development, including historic and contemporary structures, and locate facilities in the most suitable and least environmentally sensitive areas possible.
- **Land Use and Development, *Land Protection Plan Elements*, Management Goal:** Make sure that land uses on public and private lands are compatible with the purposes of Lake Chelan NRA, emphasizing those uses that protect natural and cultural resources and natural processes, and provide for safe visitor facilities and services.

## 1.2 BACKGROUND

### 1.2.1 OVERVIEW OF STEHEKIN RIVER FLOODING

The Stehekin River watershed encompasses approximately 220,000 acres (344 square miles). Steep slopes, a dense network of tributary streams, and the location of the river's headwaters along the wet Pacific Crest have led to the frequent and rapid rise of floodwaters on the river, perhaps more so than any other river in eastern Washington. Just above the developed lower valley, the Stehekin River is joined by three major tributaries within five miles. During flood events, deep bedrock canyons channel water, sediment, and large wood quickly to the wide lower valley below High Bridge. These narrow box canyons are potential sites for the formation and failure of temporary debris dams, which add an unpredictable element to flooding on the Stehekin River. The record peak flow of 25,600 cubic feet per second (cfs) on the Stehekin River occurred in October 2003. The second and third largest flood events on the Stehekin River occurred in November of 1995 and 2006, respectively. A more detailed history of Stehekin River flooding is provided in Chapter 1, Section B.1 of the *Stehekin River Corridor Implementation Plan and Final Environmental Impact Statement* (NPS 2012a).



Stehekin River flooding.

As described in section 1.1.2 of this EA, severe flooding in the valley has adversely affected NPS facilities in the valley, creating substantial property damage and interrupting Park services. Existing park facilities in the Stehekin River's CMZ and 100- and 500-year floodplains adversely affect the natural characteristics of the floodplain.

### 1.2.2 OVERVIEW OF WASTE COLLECTION ACTIVITIES AND REGULATIONS

#### 1.2.2.1 Stehekin Waste Collection Activities

Solid waste in the Stehekin area is generated in public areas, at concessioner operations, at NPS facilities, and by private businesses and residents. Public areas include the ferry landing and marina area, roadside picnic sites, and campgrounds. Concessioner (private) operations include lodging, general store, and food service operations at the NPS-owned Stehekin Landing Resort, which is now North Cascades Lodge at Stehekin. NPS facilities include the Visitor Center, staff housing, maintenance facilities, and administration facilities. A number of private residences, both seasonal and year-round, as well as several businesses in the Stehekin area also generate solid waste. Lake Chelan



NRA has established solid waste management services for NPS, concessioner and private solid waste generators in the Stehekin area, including trash collection and recycling collection services from public areas and NPS facilities, and receiving, processing, and disposal for NPS, private, business, and concessioner trash and recycling. Concessioner trash is collected and processed by the concessioner and transportation and disposal is paid for by the Lake Chelan NRA. Waste consolidated at the NPS transfer station is shipped by barge 55 miles down the lake for ultimate disposal. The existing transfer station is located at the site of the NPS maintenance facility near the Stehekin Airstrip.



Existing transfer station.

The Lake Chelan NRA provides solid waste management services to all generators, public and private, in the Stehekin area at no cost (NPS 2012c) to deter small dumps on private lands and illegal dumping on public lands. Providing trash transfer and disposal services to private generators is unusual for a NPS facility and out of compliance with current requirements of 36 CFR Part 6 – Solid Waste Disposal Sites in Units of the National Park System (see section 1.3.2 of this EA, Solid Waste Handling Laws and Regulations).

### 1.2.2.2 Waste Regulations

In 1977, the NPS closed the Stehekin dump to comply with the Resource Conservation and Recovery Act of 1976, which amended the Solid Waste Disposal Act (Public Law 98-506) and prohibited open dumps. Because private residents and businesses had no alternative for solid waste disposal, the NPS began operating a solid waste recycling, compaction, and transfer facility to deter proliferation of small dumps on private lands and illegal dumping on public lands (NPS 2012c).

In 1994, solid waste disposal regulations for the NPS were enacted (36 CFR Part 6 – Solid Waste Disposal Sites in Units of the National Park System) in response to a statutory requirement of Public Law 98-506. These regulations identify transfer stations as solid waste disposal sites and stipulate requirements for existing solid waste facilities as well as implement restrictions on all new solid waste facilities in parks.

The solid waste disposal regulations require NPS to show that there is no reasonable alternative site outside the boundaries of the unit suitable for solid waste disposal. The park determined that there was no reasonable alternative to the collection and handling facility for solid waste within the NRA. Stehekin is located at the mouth of a narrow river valley intersecting the Lake Chelan reservoir with limited land available for development outside the CMZ. The NRA is overlaid by the Stephen Mather Wilderness, which envelopes the Stehekin Valley on all sides until it intersects Lake Chelan. Furthermore, there are no roads that link Stehekin to the greater transportation network or provide access to sites suitable for solid waste disposal outside the Stehekin Valley. Solid waste must be sorted and consolidated in Stehekin before being shipped down Lake Chelan via barge. The final solid waste disposal landfill site lies outside of the boundaries of the NRA.

Furthermore, 36 CFR Part 6.8(a) prohibits the disposal of solid wastes at NPS-operated solid waste disposal sites from sources other than NPS activities after January 23, 1996. Since that date, the Lake Chelan NRA has been out of compliance with this regulation.

In 1995, a NPS report on solid waste management in Stehekin recommended that a new facility be created, located outside the floodplain and using modern technology to handle the solid waste. The 1995 Lake Chelan NRA GMP identified the location for this new facility and recommended a user fee system through private contracts for solid waste disposal in accordance with county, state, and federal regulations.

In 1997, an Integrated Solid Waste Alternatives Plan (ISWAP) assessing solid waste management practices in Stehekin proposed an economically and environmentally sound integrated solid waste

management system. This system included relocating and upgrading the current facility as well as using a rate structure to cover expenses. The ISWAP suggested that a portion of the capital funding needed for implementation be requested from Chelan County, due to the assumption that property tax revenue collected from Stehekin residents was used to provide solid waste services for County residents. However, Chelan County tax revenue is not directed toward Chelan County's solid waste activities or transfer stations, which are completely funded through tip fees.

A 2006 ISWAP addendum further recommended improving the waste handling operations at the transfer station and implementing a fee structure to reduce the financial burden on the Lake Chelan NRA and to encourage waste reduction. In 2012, the Lake Chelan NRA prepared a Final ISWAP to address some of these recommendations and to coordinate with relocation of the administrative facilities by including additional aspects of solid waste handling facility improvements and design, a rate structure analysis, and analysis of compliance with 36 CFR Part 6.

The ISWAP must comply with several regulatory and guidance documents that identify policy, recommendations, and goals for solid waste management.

- NPS Solid Waste Management Handbook, June 1996
- Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed January 24, 2007
- Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), signed October 5, 2009

To enact the changes recommended by the ISWAP, a regulatory change will be necessary to allow NPS to legally site a new solid waste facility on NPS land and to collect non-NPS generated solid waste. This process is currently being pursued by NPS.

### **1.3 LAWS, REGULATIONS, AND POLICIES GUIDING THIS DECISION**

This section includes laws, regulations, executive orders, NPS policy, and North Cascade NPS Complex planning documents and studies applicable to the proposed action.

#### **1.3.1 PLANS**

##### **1.3.1.1 Lake Chelan National Recreation Area Final General Management Plan/Environmental Impact Statement**

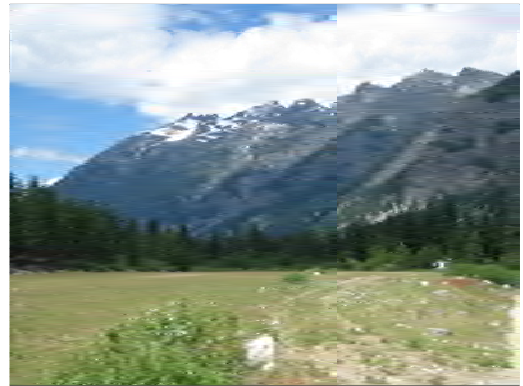
The 1995 GMP for Lake Chelan NRA provides the most site-specific policy guidance to the NPS for administration of Lake Chelan NRA. The GMP provides guidance on managing visitor use, natural and cultural resources, development, and operation of Lake Chelan NRA according to the previously cited enabling legislation for Lake Chelan NRA, the Organic Act, and other laws and regulations affecting management of the NRA. The Final GMP (NPS 1995) identifies the key features and actions associated with the selected alternative in the GMP. Because it is derived from the GMP, it contains the vision for Lake Chelan NRA:

*The rustic setting of Lake Chelan (LACH) would be part of a transition from the down lake recreational, residential, agricultural, and industrial setting to the very wild and natural North Cascades National Park. The use of LACH resources by visitors and residents would be limited to preserve the natural, scenic, and cultural values of the area. (NPS LACH 1995c: 5).*

The Final GMP (NPS 1995) provides some additional detail about the management objectives and corresponding actions that would be undertaken by the NPS in Stehekin. This plan identifies the following actions associated with the management of Lake Chelan NRA that would be implemented or clarified by the proposed action. The actions below are consistent with the purpose, significance, and management objectives outlined in section 1.1.5.

- NPS structures that could be threatened by river processes would be relocated (NPS 1995).

- The natural character of the lake and river edge on public lands (includes areas within 200 feet of the lake and river shoreline) would be restored (NPS 1995).
- The current character (slow leisurely pace) and surface (chip seal) of the main valley road from Landing to Harlequin Bridge would be maintained (NPS 1995).
- Some NPS and concession housing would be consolidated in clustered sites beside the airstrip, based on environmental parameters and in compliance with compatibility criteria (NPS 1995).
- NPS vehicle fuel storage / dispensing would be relocated to the redesigned airstrip (NPS 1995).
- Maintenance facilities would be located near the airstrip (NPS 1995).



Stehekin Airstrip.

### 1.3.1.2 Stehekin River Corridor Implementation Plan and EIS

In July 2012, NPS released a Final (EIS for the SRCIP (NPS 2012a). The SRCIP / Final EIS was prepared in response to the effects of the increased frequency and magnitude of flooding on the Stehekin River and the adverse effects the flooding has had on NPS infrastructure and private lands in the lower Stehekin Valley. The plan enables NPS to meet the goals and direction provided in the 1995 Lake Chelan NRA GMP. The major management decisions of the SRCIP were 1) identification of the Stehekin River CMZ and use of it as a more conservative version of regulatory floodplain given frequent rapid changes (bank erosion) on high-gradient mountain rivers, and 2) direction of new development to active alluvial fans (see section 3.2.2 for more information on alluvial fans) as a better alternate to developing in the CMZ. As a result of the plan and EIS process, NPS made the decision to relocate the NPS administrative facilities, which are currently located in the CMZ and floodplain, to a new location outside of the CMZ and floodplain near the Stehekin Airstrip. This EA tiers off of the 2012 Final EIS and specifically evaluates what administrative facilities (maintenance and housing) would be constructed and precisely where they would be located.

### 1.3.1.3 Integrated Solid Waste Alternatives Plan

See section 1.2.2, Overview of Waste Collection Activities and Regulations (NPS 2012c).

## 1.3.2 POLICIES

### 1.3.2.1 National Park Service Mandates and Policies

#### ***Organic Act (1916) [16 U.S. Code (USC) 1]***

The Organic Act, which established the NPS and the purpose of national parks, applies to all units of the national park system, including Lake Chelan NRA.

*The National Park Service shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified...by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.*

The prohibition against impairment in the Organic Act has been described in the NPS *Management Policies 2006* (NPS 2006) and Director's Order 12 (Conservation Planning, Environmental Impact Analysis, and Decision-making).

### **NPS Management Policies 2006**

*Management Policies 2006* (NPS 2006) governs the way park managers make decisions on a wide range of issues that come before them. Excerpts from several sections applicable to this EA are highlighted below.

#### **Section 1.4.3, The NPS Obligation to Conserve and Provide for Enjoyment of Park Resources and Values**

*The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. This mandate is independent of the separate prohibition on impairment and applies all the time with respect to all park resources and values, even when there is no risk that any park resources or values may be impaired. NPS managers must always seek ways to avoid, or to minimize to the greatest extent practicable, adverse impacts on park resources and values. The laws do give the Service the management discretion, however, to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.*

*The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment that is contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act.*

#### **Section 4.1.5, Restoration of Natural Systems**

*The Service will reestablish natural functions and processes in unnaturally disturbed components of natural systems in parks when practicable unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect other park resources, developments, or visitor safety. Potential impacts to natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. When practicable the Park Service will seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological community structure and function.*

#### **Section 4.4.4.2, Removal of Exotic Species Already Present**

*All exotic plant and animal species that are not maintained to meet an identified park purpose will be managed...*

#### **Section 4.4.5, Pest Management**

*All park employees, concessioners, contractors, permittees, licensees, and visitors on all lands managed or regulated by the National Park Service will comply with NPS pest Management Policies.*

#### Section 9.4.3, Employee Housing

*The Park Service will generally rely on the private sector to provide housing for NPS employees. If reasonable price and quality housing is not available in the private sector, the Service will provide only the number of housing units necessary to support the NPS mission.*

*Occupancy may be permitted or may be required to provide for timely response to park protection needs, to ensure reasonable deterrence to prevent threats to resources, and to protect the health and safety of visitors and employees. Acceptable and appropriate locations for employee housing will be determined based on these prevention or response services provided for the benefit of the government in meeting the NPS mission.*

#### Section 9.4.4, Maintenance Structures

*Maintenance structures will be consistent in design, scale, texture, and details with other park facilities. Optimally, they will be screened or located in areas remote from public use. Wherever feasible, NPS and concessioner maintenance facilities will be adjacent and integrated in design to facilitate operations and reduce impacts on park resources.*

#### **Director's Order 35B (Cost Recovery for NPS Produced Utilities)**

Director's Order 35B (Cost Recovery for National Park Service Provided Utilities) (NPS 2011) provides policies and procedures for recovering costs associated with providing utility services, including solid waste and recycling services, to non-NPS users. The Order specifies complete cost recovery when providing utility services, including annual operating costs, cyclical repair and rehabilitation costs, and capital investment costs to non-NPS users. Implementation guidelines provide direction on determining costs and rate structures, recovering costs, and phasing implementation of a cost recovery system.

#### **Director's Order 36 (NPS Housing Management)**

Director's Order 36 (NPS Housing Management) (NPS 2009a) clarifies specific provisions of NPS *Management Policies 2006* and establishes specific instructions and requirements concerning the management of NPS housing assets. The Order specifically provides guidance in carrying out several NPS commitments, including to provide housing “that is safe, sanitary, and as energy efficient as possible.” Section 6.1 of the Order, Standards for Housing, goes on to specify:

*“...NPS housing will be safe and sanitary, sited to avoid natural hazards, integrated into the park environment, and, to the best extent possible, energy efficient and cost-effective to maintain....It is important to ensure that sub-standard housing is eliminated or upgraded and that quality, well-designed, long-term housing facilities with full life-cycle cost considerations are properly constructed, rehabilitated, and maintained.”*

#### **Director's Order 77-1 (Wetland Protection)**

This Director's Order establishes the policies, requirements, and standards through which the NPS will meet its responsibilities to protect and preserve wetlands, including implantation of Executive Order 11990 (Protection of Wetlands). The NPS has developed a procedural manual to direct implementation of this Director's Order (NPS 2012d). The manual explains NPS policy on mapping and delineation of wetlands, permitting of various types of typical NPS activities, analysis of wetland impacts, and determination of appropriate avoidance, minimization, and mitigation measures. This Director's Order requires preparation of a Statement of Findings for actions that result in adverse impacts to wetlands. A Wetlands Statement of Findings was prepared as part of the SRCIP Final EIS (Volume II, Appendix 17). Because the proposed action will not result in an adverse impact to wetlands, a separate Statement of Findings for wetlands is not required.

#### **Director's Order 77-2 (Floodplain Management)**

Director's Order 77-2 (Floodplain Management) (NPS 2003) requires federal agencies to develop agency-specific guidance, provide leadership, and take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the

natural and beneficial values served by floodplains. The Order specifies that NPS will “*restore, when practicable, natural floodplain values previously affected by land use activities within floodplains.*”

This Order requires preparation of a Statement of Findings for actions that result in adverse impacts to floodplains. A Floodplains Statement of Findings was prepared as part of the SRCIP Final EIS (Volume II, Appendix 17). Because the proposed action will provide a benefit to the Stehekin River floodplain, a separate Statement of Findings for floodplains is not required.

### **1.3.2.2 Related Laws and Regulating Policies**

#### ***Clean Water Act***

The Clean Water Act is a national policy to restore and maintain the chemical, physical, and biological integrity of waters of the United States (U.S.); to enhance the quality of water resources; and to prevent, control, and abate water pollution. Sections 404 and 401 of the Clean Water Act apply to new construction that would involve the discharge of fill material and placement of a structure into waters of the U.S., such as the Stehekin River, its tributaries, or adjacent wetlands. Also, Section 402 of the Clean Water Act creates the National Pollutant Discharge Elimination System (NPDES) regulatory program. The NPDES program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more, including smaller sites in a larger common plan of development or scale, to obtain coverage under an NPDES permit for their stormwater discharges. The proposed action will require an NPDES permit based on its proposed amount of clearing and grading.

#### ***Executive Order 11988 (Floodplain Management)***

All flowing waters and their tributaries are considered waters of the U.S. and fall under the jurisdiction of the U.S. Army Corps of Engineers (Corps). Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, “*each agency shall provide leadership and shall take action to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities*” for the following actions (FEMA n.d.):

- acquiring, managing, and disposing of federal lands and facilities
- providing federally-undertaken, financed, or assisted construction and improvements
- conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities

#### ***Executive Order 11990 (Protection of Wetlands)***

Executive Order 11990 (Protection of Wetlands) (42 FR 26961, 3 CFR, 1977 Comp.) is intended to “*minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.*” To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided.

#### ***Executive Order 13112 of February 3, 1999 (Invasive Species)***

Executive Order 13112 (Invasive Species) is intended to “*prevent the introduction of invasive species and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded and not to authorize or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species.*” To meet these objectives, the Order requires each Federal agency to consider its actions relating to the potential of the spread of invasive species and to take mitigating actions.

#### ***Endangered Species Act, as Amended***

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Department of the Interior’s U.S. Fish and Wildlife Service (USFWS) and the Commerce Department’s National Marine Fisheries Service

(NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine species such as salmon and whales.

Section 7 of the ESA requires all federal agencies including the NPS to use their legal authorities to promote the conservation purposes of the law. This section also requires federal agencies to consult with the USFWS or NMFS to ensure that actions they authorize, fund, or carry out would not jeopardize listed species.

#### ***National Historic Preservation Act (1966 as amended)***

The purpose of the NHPA is to preserve, conserve, and encourage the continuation of the diverse traditional prehistoric, historic, ethnic, and folk cultural traditions that underlie and are a living expression of American heritage. The act directs federal agencies to inventory historic properties (Section 110) and to take into account the effect of any undertaking (a federally funded or assisted project) on historic properties (Section 106). Historic property is any district, building, structure, site, or object that is eligible for listing in the National Register of Historic Places (NRHP) because the property is significant at the national, state, or local level in American history, architecture, archeology, engineering, or culture. Requirements for implementing Section 106 are found in the Code of Federal Regulations (36 CFR Part 800).

#### ***Solid Waste Handling Laws and Regulations***

##### Federal

36 CFR Part 6 – Solid Waste Disposal Sites in Units of the National Park System, stipulate requirements for existing solid waste facilities as well as implement restrictions on all new solid waste facilities in parks. Furthermore, 36 CFR Part 6.8(a) prohibits the acceptance of solid wastes from sources other than NPS activities after January 23, 1996. 36 CFR Part 6.4(a) specifies that no person may operate a solid waste disposal site within the boundaries of a NPS unit unless the criteria in Section 6.4(a) are met and the operator has shown and the Regional Director finds that there is no reasonable alternative site outside the boundaries of the unit suitable for solid waste disposal, including solid waste transfer facilities. Outside the boundaries of Lake Chelan NRA, the NRA is surrounded by National Forest Service and NPS designated wilderness areas, which would not provide any reasonable alternative sites for solid waste disposal. This includes the NOCA South Unit and the Stephen Mather Wilderness Area to the north, the Lake Chelan Sawtooth Wilderness Area to the east and south, and the Wenatchee National Forest to the west. Specific location requirements identified in Section 6.4(a) include that the site is not located within one mile of a NPS visitor center, campground, ranger station, entrance station, or a residential area, and that the site is not detectable by public sight, sound, or odor from a scenic vista, public use facility, designated or proposed wilderness area, historic site, or public road. The NPS has determined that there are no suitable locations for a new transfer station for the Stehekin community that meet all of the site location requirements outlined in 36 CFR Part 6(a).

36 CFR Part 7 – Special Regulations, Areas of the National Park System, lists park-specific regulations that, in limited circumstances, may create an exception to a prohibition found in a general regulation. 36 CFR 7.62, Lake Chelan National Recreation Area, currently provides park-specific regulations for (a) Snowmobiles, (b) Aircraft, and (c) Weapons within Lake Chelan NRA. In order to continue the collection of solid waste from non-NPS users in the Stehekin community, and to establish a new solid waste disposal site that does not meet all of the criteria in 6.4(a), NPS must pursue a regulatory change that would replace paragraph (c) **Weapons** with paragraph (c) **Solid Waste**.<sup>1</sup>

The rulemaking process entails drafting the supplementary information and proposed rule language; completing a cost benefit analysis of economic impacts associated with the proposed rule; publishing the proposed rule in the Federal Register with a minimum 60-day public comment period; responding

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<sup>1</sup> This regulatory change is occurring in coordination with a separate effort to close and clean up lead contamination at the site currently designated for target practice under 36 CFR Part 7.2(c) Weapons. The decision to close the site designated for target practice under paragraph (c) is documented in the Final SRCIP / Final EIS and Record of Decision.



to comments and completing any necessary edits to the proposed rule language; and publishing the final rule in the Federal Register. The final rule goes into effect 30 days after publication.

### State

Chapter 70.95 Revised Code of Washington (RCW), *Solid Waste Management*, establishes a comprehensive statewide program for solid waste handling, and solid waste recovery and/or recycling in the state of Washington. This chapter assigns primary responsibility and planning for adequate solid waste handling to local government; provides for the adoption and enforcement of basic minimum performance standards for solid waste handling; encourages the development and operation of waste recycling facilities; provides technical and financial assistance to local governments in the planning, development, and conduct of solid waste handling programs; and promotes consistency in the permitting requirements for waste recycling facilities. RCW 70.95.010(6)(c) directs “*county and city governments to assume primary responsibility for solid waste management and to develop and implement aggressive and effective waste reduction and source separation strategies.*” NPS will work with Chelan County to ensure Chelan County can meet legal responsibilities for solid waste management in Stehekin. Like the NPS, Washington State aims to divert/recycle greater than 50% of material from the landfill waste stream.

Chapter 173-350 of the Washington Administrative Code (WAC), *Solid Waste Handling Standards*, was adopted under the authority of chapter 70.95 RCW. Chapter 173-350 WAC sets minimum functional performance standards for the proper handling and disposal of solid waste; describes the responsibility of various entities related to solid waste; establishes requirements for the location, design, construction, operation, and closure of solid waste handling facilities; and establishes statewide minimum standards for solid waste handling. This chapter specifies that certain solid waste facilities are exempt from solid waste permitting if they meet certain requirements and operating procedures as identified in the rule.

In the state of Washington, solid waste facilities are permitted by the local Jurisdictional Health Departments (JHD). For the Lake Chelan NRA, this is the Chelan Douglas Health District. There are several different solid waste handling facilities types that require permits in Washington State, which include: composting facilities, land application sites, intermediate solid waste handling facilities (transfer stations, bailing and compaction sites, and drop boxes), piles for treatment and storage, surface impoundments and tanks, waste tire storage facilities, and moderate risk waste facilities. All of these facilities are regulated under Chapter 173-350 WAC. The local JHDs have the responsibility to issue permits and enforce the regulations. Under RCW 70.95.160, they are required to adopt regulations that may be more stringent than the State’s “minimum” standards. The permit process is outlined in Chapter 70.95 RCW, with specific permit application procedures outlined in Chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills* and Chapter 173-350 WAC for other solid waste facilities.

## **1.4 SUMMARY OF PUBLIC SCOPING**

Scoping is a process that is used to determine the issues that need to be addressed in a NEPA environmental document such as this EA. NPS staff typically conducts both internal and external scoping. Internal scoping is an interdisciplinary process that brings the various NPS resource specialists together to formulate purpose and need, define issues, develop alternatives, identify data needs, and determine any similar or cumulative actions associated with the action. External scoping involves gathering comments on the action from the public, agencies, and tribes.

The public scoping period for this EA began on June 11, 2013, and ended on July 10, 2013. During this time, NPS held three open house public meetings in Stehekin (June 24, 2013), Wenatchee (June 25, 2013), and Seattle (June 26, 2013). A site walking tour was also conducted in Stehekin on June 25, 2013. The meetings were attended by approximately 30 people. NPS staff and consultants recorded 29 comments on flip charts during the meetings. Eleven public comment letters were received during the scoping period: nine from individuals, one from a non-profit organization, and one from a Tribe.



Public comments from both the meetings and letters were generally related to alternatives, design issues, and previously identified issues. Relative to the range and definition of alternatives to be evaluated in the EA, the public recommended consideration of the gravel pit west of the airstrip as an alternative site for the new maintenance facility; consideration of alternatives that both include and exclude the land exchange property near the airstrip as part of the new maintenance facility; incorporation of floodproofing of the existing maintenance facility as part of the no action and action alternatives; and identification of the planned use for the existing maintenance facility site after it is demolished as part of the action alternatives. Several comments expressed preference for one housing site over another; however, an overwhelming preference for any one site was not evident.



Public scoping meeting in Stehekin.

Design issues raised by the public during the comment period include consideration of energy efficiency and the overall electrical demands of the new maintenance facility; use of a non-polluting, high-intensity incinerator at the new solid waste facility; a comprehensive composting and recycling program at the new maintenance facility; and light pollution and preservation of night skies in the design of the new maintenance facility.

Several concerns raised by the public during scoping that were previously identified by NPS staff for evaluation in the EA include the new fee structure for solid waste disposal; generation of additional traffic, dust, and noise along Company Creek Road from the new maintenance facility; protection of land exchange properties; electrical demands of the new maintenance facility; and potential impacts on archeological resources within or near the proposed maintenance facility and housing locations (Confederated Tribes of the Colville Reservation).

## 1.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

### 1.5.1 PRIMARY ISSUES

Issues were identified by a NPS interdisciplinary planning team, the public, and other agencies during the public scoping process. Issues are problems, concerns, and opportunities regarding the current and future location and management of the NPS maintenance, solid waste operations, fire operations, and housing facilities at Stehekin. These issues formed the basis for the impact topics that are carried forward and discussed in chapter 3 of this EA. Impact topics identify the resources or values that would be affected by the alternatives. The issue statements and corresponding impact topics developed by the interdisciplinary team are presented below.

- Structures within the CMZ modify floodplain natural resource values such as flood flows, vegetation, and natural channel migration. Flooding also damages NPS property and impacts park operations. Existing structures are threatened by flooding, bank undercutting, and flood scouring. Removing existing structures from the CMZ would allow the Stehekin River to flow with fewer artificial constraints and eliminate damage to facilities and equipment. These issues are evaluated under the *Stehekin River CMZ and Floodplain* and *Park Operations* impact topics. Because the action alternatives of this project would provide a benefit to the Stehekin River floodplain, a Statement of Findings for floodplains is not required.
- Construction of new facilities would include ground-disturbing activities that would affect previously disturbed and undisturbed soils and landforms, and would result in the removal of vegetation, potentially including the loss of some mature or old growth trees. Ground disturbance and vegetation removal could spread or introduce invasive plant species and adversely affect water quality in the Stehekin River. However, removal of existing facilities would allow for the restoration of these sites to more natural conditions and improve water

quality and the integrity of the riparian zone. These issues will be addressed under the following impact topics: *Soils and Surficial Landforms*; *Vegetation and Wetlands*; and *Water Quality of the Stehekin River*.

- Construction activity and new development may affect state and federally listed species. These species are addressed under the *Species of Special Concern* impact topic.
- Visual, dust, and noise intrusions and traffic associated with construction activity and new development could negatively impact users of Harlequin Campground and visitors and community residents that recreate or live near the proposed airstrip area development site. Conversely, local economic benefits from increases in the construction workforce and revenues for local businesses generated from construction activities and workers could occur. These issues will be addressed under the following impact topics: *Visitor Use and Experience* and *Socioeconomics*.
- The density, scale, design character, and outside lighting of the new structures could all affect how well the facilities blend with the surrounding landscape. New structures may affect views from sections of the Stehekin River trail, trails overlooking the valley, and residences adjacent to the site and along Company Creek Road. These issues will be addressed under the *Visitor Use and Experience* impact topic.
- Public health and safety and natural resources are threatened by potential release and dispersion of hazardous substances during a flood. Outdated septic systems currently located in the CMZ could degrade water quality, contaminate soils, and potentially pose public health concerns during flood events if contaminants enter the floodwaters. The maintenance facilities contain numerous sources of potential pollution, such as heavy equipment, storage of paints and solvents, solid waste, and septic fields. Storing hazardous materials in flood-prone areas and within the vicinity of wetlands could also adversely affect natural resources and public health. Eliminating these facilities from the CMZ would help protect resources and public health. Developing facilities near the Stehekin Airstrip may also pose safety concerns to staff during emergency aircraft landings, although Federal Aviation Administration setback requirements would be followed to mitigate this risk. Concerns about hazardous substances will be addressed under the following impact topics: *Soils and Surficial Landforms*; *Vegetation and Wetlands*; *Stehekin River and Floodplains*; and *Public Health and Safety*.
- The existing facilities and infrastructure are in poor condition, inefficient to operate, and costly to maintain. Fire management operations are hampered by lack of adequate facilities for fire crews and equipment. Maintaining winter access to dispersed park service facilities requires extensive labor, time, and dedicated equipment for snow removal. Construction of new facilities would reduce the cost of park management and operations, and improve energy efficiency. These issues are addressed under the *Park Management and Operations* impact topic.
- NPS has determined that a recycling and transfer station is needed in the park in order to prevent degradation to resources, and that there is no feasible alternative to continue to collect and transfer solid waste from non-park operations. Because of this, NPS is pursuing a regulatory change to authorize this action, as well as for allowing the placement of the transfer station near a campground, airstrip, and housing. Once the rule change is finalized, NPS or another entity would run the existing or a new facility and collect fees required by Director's Order 35B. The effects of running the new facility will be addressed under the following impact topics: *Visitor Use and Experience*; *Socioeconomics*; and *Park Management and Operations*.
- The site for the new maintenance facility near the Stehekin Airstrip has been substantially modified by previous development, and habitat quality is generally not favorable for many wildlife species. Consolidating facilities in this area would have a negligible effect on most wildlife species, except for certain species that are commonly found in the area or are otherwise tolerant of human disturbance. Some relatively common wildlife species, such as

black bears and birds, could be attracted to the area due to the scents and potential rewards associated with garbage and compost. These attractants could create wildlife/human conflicts that are not currently present in the area. The issue of wildlife/human conflicts is addressed under the *Wildlife* and *Public Health and Safety* impact topics.

- The proposed maintenance, solid waste, and fire facility and housing site would be outside of the 100-year floodplain and CMZ of the Stehekin River. However, the proposed site would be on a portion of the Company Creek alluvial fan. Alluvial fans develop over time as large flood events periodically deposit sediment. Active alluvial fans have the potential to shift the flow path of the river that forms them during a large flood event. Because this project is proposed on an alluvial fan, there is the potential for flooding and channel avulsion through the new facility. The issue of potential hazards associated with the alluvial fan is addressed in the *Public Health and Safety* impact topic.

## 1.5.2 ISSUES DISMISSED FROM FURTHER ANALYSIS

The following issues are identified as typical topics for analysis in a NPS EA and would not be affected by the proposed project or it was determined that issues associated with these topics would have minor or negligible impacts. Minor to negligible effects are localized impacts that would be below or at the lowest level of detection and barely measurable, relative to existing conditions, and would have no appreciable consequences. Therefore, these issues were dismissed from further analysis. The rationale for dismissal is given below.

### 1.5.2.1 Wilderness

The Washington Park Wilderness Act of 1988 (Public Law 100-668) designated 639,840 acres, or 93%, of the North Cascades NPS Complex as the Stephen Mather Wilderness. Proposed new facilities would not be located within the Stephen Mather Wilderness. The natural, undeveloped, and untrammelled wilderness characteristics would remain unchanged and there would continue to be opportunities for solitude and primitive unconfined recreation. Therefore, this issue has been dismissed from further analysis.

### 1.5.2.2 Air Quality

The Clean Air Act (CAA) of 1963 as amended (42 USC 7401 et seq., PL 88-206) 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 NPS units. Section 118 of the CAA requires a park unit to meet all federal, state, and local air quality pollution standards. The U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) for a variety of pollutants, including carbon monoxide, lead, nitrogen dioxide, fine particles, total suspended particulates, ozone, and sulfur dioxide. Washington State has established Washington Ambient Air Quality Standards that apply throughout the state.

Lake Chelan NRA is a class II area under the CAA. The surrounding NOCA and Glacier Peak Wilderness are class I areas (NPS 2010a). Class II areas allow only moderate increases in certain air pollutants, while class I areas (primarily large national parks and wilderness areas) are afforded the highest degree of protection, meaning that very little deterioration of air quality is permitted. The CAA states that park managers have an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse air pollution impacts (EPA 2000). The North Cascades NPS Complex is considered within an attainment zone for all ambient air quality standards. Air quality is very good, with periodic effects from windborne pollutants originating in Puget Sound, Columbia River Valley, or local wildfires. Impacts on air quality would be limited to short-term construction impacts, such as generation of fugitive dust and burning of fossil fuels by trucks and other transportation. Equipment at the new maintenance facility would have similar or better energy efficiency than existing equipment, so no long-term measureable impacts on air quality are expected. Therefore, this issue will not be further addressed.

### 1.5.2.3 Wild and Scenic Rivers

The entire Stehekin River within the North Cascades NPS Complex and Lake Chelan NRA is considered eligible for Wild and Scenic status (NPS 2010a). Under the Wild and Scenic Rivers Act (16 USC 1271–1287), “certain selected rivers of the Nation, which with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.” No impacts are expected to the Stehekin River that could adversely affect the outstandingly remarkable values that qualify it for the National Wild



Stehekin River.

and Scenic River System, which includes scenery, recreation, geology, fish, wildlife, history, cultural, and other values (NPS 2010b). The free-flowing condition of the existing river channel would be maintained. The free-flowing condition of the CMZ would be improved by removal of multiple structures and foundations from it. Fish and wildlife populations associated with the river would benefit from the removal of buildings from the Stehekin River CMZ. Local geology, scenery, culture, and history would not be affected. Therefore, this issue will not be further addressed.

### 1.5.2.4 Natural Soundscapes

Park soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationship among natural sounds of different frequencies and volumes in the park (NPS 2006). NPS Director’s Order 47 (Sound Preservation and Noise Management) (NPS 2000b) defines operational policies to protect, maintain, or restore the natural soundscape.

Construction activities, including excavation, clearing and grading, and operation of construction equipment and vehicles, could be the primary sources of noise. Short-term noise impacts would occur during construction activities. Operation of new solid waste treatment facilities, including recycling activities, would relocate and concentrate long-term noise sources that are currently dispersed in the valley. There could be additional noise sources, such as a glass pulverizer; however, these activities would be located in areas that already support a variety of unnatural sounds generated by human activities. Because impacts on the natural soundscape would be localized, and mitigation would be used to further reduce or limit impacts, this issue has been dismissed from additional consideration.

### 1.5.2.5 Lightscaapes

Management Policies 2006 (NPS 2006) states that “*the Service will preserve, to the greatest extent possible, the natural lightscaapes of parks, which are natural resources and values that exist in the absence of human-caused light.*” The stars, planets, and moon, visible during clear nights, influence people and many other species of animals, such as birds, terrestrial predators, and prey. Stehekin residents currently utilize the airstrip for star-gazing. Concerns were raised during public scoping about potential light pollution at the airstrip associated with the new maintenance facility, which may affect the preservation of night skies. The proposed actions would not introduce or increase artificial light sources in the environment beyond current or historic levels and would preserve the ability to see natural features visible on clear nights. All exterior lights at the new maintenance facility would minimize light pollution through the use of down-lighting, occupancy sensors, and timers. The new lighting would provide less light pollution than the existing maintenance and solid waste facility. Therefore, this issue will not be further addressed.

#### 1.5.2.6 Historic Structures and Districts

Consideration of the impacts on historic properties is required under provisions of Section 106 of the NHPA (1966), as amended, and the 2008 NPS Programmatic Agreement among the NPS, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (NPS et al. 2008). It is also required under the NPS *Management Policies 2006* (NPS 2006). Federal land managing agencies are required to consider the effects proposed actions may have on properties listed in, or eligible for inclusion in, the NRHP, and to allow the Advisory Council a reasonable opportunity to comment. Agencies are required to consult with federal, state, local, and tribal government/organizations; identify historic properties; assess adverse effects to historic properties; and negate, minimize, or mitigate adverse effects to historic properties while engaged in any federal or federally assisted undertaking (36 CFR Part 800).

A NHPA Section 106 cultural resource inventory was completed by NPS in April of 2014. Twenty-eight buildings and structures are currently listed or identified as eligible for the NRHP in the lower Stehekin Valley. Six buildings and structures are individually listed: the Stehekin School, the eligible Imus house (and two associated outbuildings), the George Miller House, the Purple Point – Stehekin Ranger Station House (and associated woodshed), and Courtney Cabin. Twenty of these buildings are listed in two historic districts: Buckner Homestead Historic District (thirteen associated buildings and structures), and Golden West Lodge Historic District (seven associated buildings and structures). None of these buildings or structures would be directly or indirectly impacted by the proposed action. All of the structures proposed for demolition in the project area have been determined ineligible for listing on the NRHP. The State Historic Preservation Officer (SHPO) concurred with the determination of no effect in July 2014. Therefore, this issue is dismissed from further consideration.

#### 1.5.2.7 Cultural Landscapes

A cultural landscape is a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein that are associated with an historic event, activity, or person, or exhibiting other cultural or aesthetic values. Cultural landscapes have been recognized by the NPS as cultural resources since 1983, and our responsibilities for their preservation are equal to other resources regardless of the landscape type or level of significance. A NHPA Section 106 cultural resource inventory was completed by NPS in April of 2014. There are two cultural landscapes in the lower Stehekin Valley: Buckner Homestead and Golden West Lodge. Both landscapes have Cultural Landscape Inventories (NPS 2012a). Both landscapes were re-certified in 2013. Neither of these landscapes would be directly impacted by the proposed action as described. SHPO concurred with the determination of no effect in July 2014. Therefore, this issue is dismissed from further consideration.

#### 1.5.2.8 Ethnographic Resources

Ethnographic resources are defined as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it (NPS 1998). According to NPS policies contained in NPS Director's Order 28 (Cultural Resource Management) and Executive Order 13007 on sacred sites, the NPS should strive to preserve and protect ethnographic resources.

A NHPA Section 106 cultural resource inventory was completed by NPS in April of 2014. Lake Chelan NRA and the surrounding area have a history of habitation and resource use by pre-contact and contemporary American Indians. Traditional cultural properties are ethnographic resources listed on or eligible for the NRHP. No specific traditional cultural properties in the project vicinity have been identified by the Confederated Tribes of the Colville Reservation or the Confederated Tribes and Bands of the Yakama Nation (NPS 2010a). However, if during consultation the tribes were to identify ethnographic resources or if ethnographic resources are discovered during construction activities, immediate consultation and resource assessment would be undertaken, in compliance with NHPA and NPS *Management Policies 2006* (NPS 2006). No impacts on ethnographic resources from the proposed project are anticipated. SHPO concurred with the determination of no effect in July 2014. Therefore, this issue is dismissed from further consideration.

### **1.5.2.9 Museum Collections**

NPS *Management Policies 2006* and other cultural resource laws identify the need to evaluate project effects on NPS collections, if applicable. Requirements for proper management of museum objects are defined in 36 CFR 79. The North Cascades NPS Complex museum collection is comprised of specimens and objects that document the natural and cultural resources of the park (NPS 2010a). Much of the collection is the result of research projects within the complex and pre-contact site surveys and excavations. Field notes, photographs, maps, and other resource management records are integral parts of the collection. The collection is distributed between four different repository sites (Marblemount Curation Facility, Burke Museum, Fort Vancouver, and University of Idaho) and consists of over 2.3 million objects. These collections, including those from the Lake Chelan NRA, would not be affected, except by the potential addition of material to the collection (e.g., previously undetected archeological deposits) if any is found. In such a case, the expected number of artifacts would be anticipated to be quite small (less than one box). Therefore, this issue is dismissed from further consideration.

### **1.5.2.10 Environmental Justice**

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations) (59 FR 7629, as amended by Executive Order 12948, 60 FR 6381, 42 USC 4321) requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse levels of human health or environmental effects from their programs and policies on minorities and low-income populations and communities. Effects are expected to be similar for residents of the Stehekin Valley, without disproportionate effects on disadvantaged populations; therefore, this issue will not be further addressed.

### **1.5.2.11 Climate Change**

Climate change presents a large variety of potential risks and challenges to the North Cascades NPS Complex. Probable impacts associated with projected 21st century changes in Northwest climate include wetter winters, drier summers, reduced winter snowpack, and increases in extreme precipitation (UW Climate Impacts Group 2009). These effects may have adverse consequences on the ecology of the North Cascades, recreational use and enjoyment of the area, and on many aspects of the park operations, including operations in Stehekin. In fact, it has been demonstrated that the recent shift from spring to fall peak flooding on the Stehekin River is the result of climate change (NPS 2012a). The SRCIP was written in response to these ongoing changes in climate.

In response to these threats, North Cascades has become a member of the NPS's Climate Friendly Parks Program. As part of this program, North Cascades has developed a Climate Change Action Plan for combating climate change in their park (NPS 2009b). The goals of this plan include the following:

- reduce greenhouse gas (GHG) emissions from park operations to 35% below 2007 levels by the year 2016
- encourage climate friendly behavior among park staff and visitors
- preserve to the highest degree possible the park's natural and cultural resources and infrastructure by increasing resilience to climate change

Approximately 90% of the park's GHG emissions are generated by transportation related activities. Some of the strategies identified in the action plan to reduce emissions include:

- reduce fuel consumed by park staff vehicles and equipment
- reduce visitor fuel use

Other climate change-related strategies articulated in the plan include:

- promote energy efficiency and conservation in park-owned facilities
- produce clean energy or purchase electricity from a renewable energy provider

- decrease waste through source reduction
- manage waste through composting, recycling, and combustion
- reduce water use

The proposed action includes many aspects that would advance the goals of the Climate Change Action Plan, including the following:

- Improve the energy efficiency of park maintenance facilities in Stehekin by incorporating modern building materials, including improved building insulation, energy-efficient windows, and energy-efficient lighting and appliances (e.g., hot water heaters, stoves, etc.). All new structures would be designed at a minimum to the level of Leadership in Energy and Environmental Design (LEED) NC Silver or LEED for Homes Silver. The design team would also calculate the carbon footprint of all new structures, and investigate the potential for designing “Net-Zero” buildings and passive homes.
- Improve the energy efficiency of park maintenance facilities and minimize risks associated with climate change by designing the new facilities to take advantage of solar orientation and wind directionality (orient windows to the south to maximize solar gains; orient entrances to minimize snow drifting). Improve recycling and composting efforts, and reducing the waste stream in Stehekin through implementation of the ISWAP.
- Reduce employee car movements by consolidating maintenance facilities and concentrating currently dispersed resources.
- Reduce water use by installing water-saving faucets and toilets in the new facilities.

Minor increases in employee drive times between Stehekin Landing and the proposed facilities would have no measurable impact on GHG emissions in the park.

Due to the substantial number of energy-efficient improvements that would be incorporated into the proposed actions, contributions to global climate change would be negligible, other than short-term increases in GHG emissions generated by construction vehicles. These emissions are expected to be negligible, particularly compared to the primary sources of GHG emissions in the park, which are visitor vehicles traveling within the park (NPS 2009b). The proposed actions would reduce the risk to park facilities, from potential future increases in flood frequency on the Stehekin River due to climate change, by moving the facilities out of the CMZ. Therefore, this issue is not further discussed in this document.

#### **1.5.2.12 Archeological Sites**

Forty-two archeological sites have been identified within five miles of the project area. Eighteen of these sites date to the pre-contact era (pre AD 1800), 20 sites date from the post-contact era (post AD 1800), and four sites are multi-component. None of these archeological sites would be directly impacted by the proposed action. However, construction activities in previously undisturbed areas could directly affect archeological resources within or near the proposed facility locations. A NHPA Section 106 cultural resource inventory was completed by NPS in April of 2014. A wooden water stave pipe is located on the site of the new maintenance facility. The pipe is a penstock for a hydropower plant recorded as a new historical archeological site FS-313, A.W. Peterson Hydroelectric Project. The hydroelectric power plant, which is now in ruins, was the largest privately owned power plant in Stehekin and was the first to publicly supply power to the residents of the valley on a large scale, when Chelan County PUD began leasing it. The site is recommended as eligible for listing on the NRHP (Kwarsick and Miller 2014). The site will not be directly impacted by the construction of new facilities because it was identified early on during planning. All action alternatives avoid the site.

In the vicinity of the preferred housing site, a second historical archeological site was recorded — FS-314, the Wagon Road Segments site. This site is considered eligible for the NRHP for purposes of this project. The site will not be directly impacted by the construction of new facilities because it was identified early on during planning. All action alternatives avoid the site.

Since impacts to all NRHP-eligible sites will be avoided, and the SHPO concurred with the determination of no effect in July 2014, this issue is dismissed from further analysis in this document.



## CHAPTER 2. ALTERNATIVES

### 2.1 INTRODUCTION

This chapter describes the proposed alternatives, including the reasons for dismissing options that do not meet project objectives or other defined criteria. The Alternatives Comparison Summary (Table 2) highlights the major differences among the alternatives. This chapter also identifies and provides analysis related to the selection of the preferred alternative and environmentally preferable alternative, and describes how the alternatives meet the project objectives.

### 2.2 ALTERNATIVE DEVELOPMENT

The 1995 Lake Chelan NRA GMP (NPS 1995) proposes relocating the existing maintenance and solid waste facilities, fire facilities (located at the Stehekin Landing), and several residential units to the Stehekin Airstrip site. This recommendation was an effort to mitigate the damage caused by flooding events at the existing maintenance facility, centralize fire response operations, and provide a minimal impact on the Stehekin community. As a result of the SRCIP, which enables NPS to meet the goals and direction provided in the GMP, NPS made the decision to relocate the NPS administrative facilities to a new location out of the CMZ and floodplain, near the Stehekin Airstrip.

In 2010, a Development Concept Plan was developed, including site and contextual analysis, and multiple site alternatives at the airstrip (ajc 2014a). At that time, the program included maintenance, storage, solid waste, fire operations, fuel, hazardous material storage, and several single- and multi-family residential units. Seventeen layouts that included all of these functional components were evaluated as part of the original program. The scope for the residential component was later reduced to one single-family, three-bedroom unit due to NPS funding changes and concerns over the building density at the airstrip, where multiple residential units were proposed. Between 2012 and 2013, NPS prepared seven revised site layouts for the maintenance facility at the airstrip and explored seven sites for housing development in the Stehekin Valley. Various layouts were considered at each housing site. Four housing sites were reviewed and dismissed from further consideration by the NPS staff. Three site layouts for the maintenance facility at the airstrip and three housing site options were carried forward into a Choosing by Advantages (CBA)/Value Analysis (VA) workshop held by the NPS in February 2014. The CBA process is an evaluation and ranking process used by the NPS that is based on the relative advantages and costs of each alternative under consideration. The site options for the maintenance facility and housing presented at the CBA/VA workshop comprise the three action alternatives evaluated in this EA.

### 2.3 ALTERNATIVES

Four alternatives are evaluated in this EA:

- Alternative 1 (No Action)
- Alternative 2 (Preferred Alternative)
- Alternative 3
- Alternative 4

Alternative 1, the “No Action” alternative, is required by NEPA and provides a common baseline from which to evaluate the environmental impacts of each action alternative. Each action alternative would include a different layout for the new maintenance facility at the Stehekin Airstrip site, in combination with a different housing site within the Stehekin Valley. The specific layouts used in each action alternative are not mutually exclusive; each housing layout is bundled with a given maintenance facility layout as a matter of convenience, and could be organized differently. The solid waste fees would be determined based upon the continued use of the existing transfer station under the No Action Alternative, and on the use of a new transfer station under any of the action alternatives. The differences among the action alternatives are described in sections 2.3.3, 2.3.4, and 2.3.5.

### 2.3.1 ALTERNATIVE 1: NO ACTION

The No Action Alternative would largely continue existing NPS practices within the Stehekin Valley (Figure 2). Existing NPS facilities are currently distributed throughout the lower Stehekin Valley. The existing maintenance facility, which consists of a solid waste transfer station, equipment maintenance building, small break building, hazardous materials storage building, fuel storage and filling area, and several small storage structures and outbuildings, would continue to operate in its current location in the 100-year floodplain (Figure 3). The existing fire facilities, including equipment and vehicle storage and fire crew housing, would remain in their current location at the Stehekin Landing. All existing NPS housing facilities would also remain in their current location and use. Replacement and relocation of the maintenance facility and NPS housing as discussed in the 1995 GMP (NPS 1995) would not occur at this time. Limited actions that would be taken by NPS as part of Alternative 1 related to solid waste activities are described below.

**Figure 2: Alternative 1 (No Action) Overview**

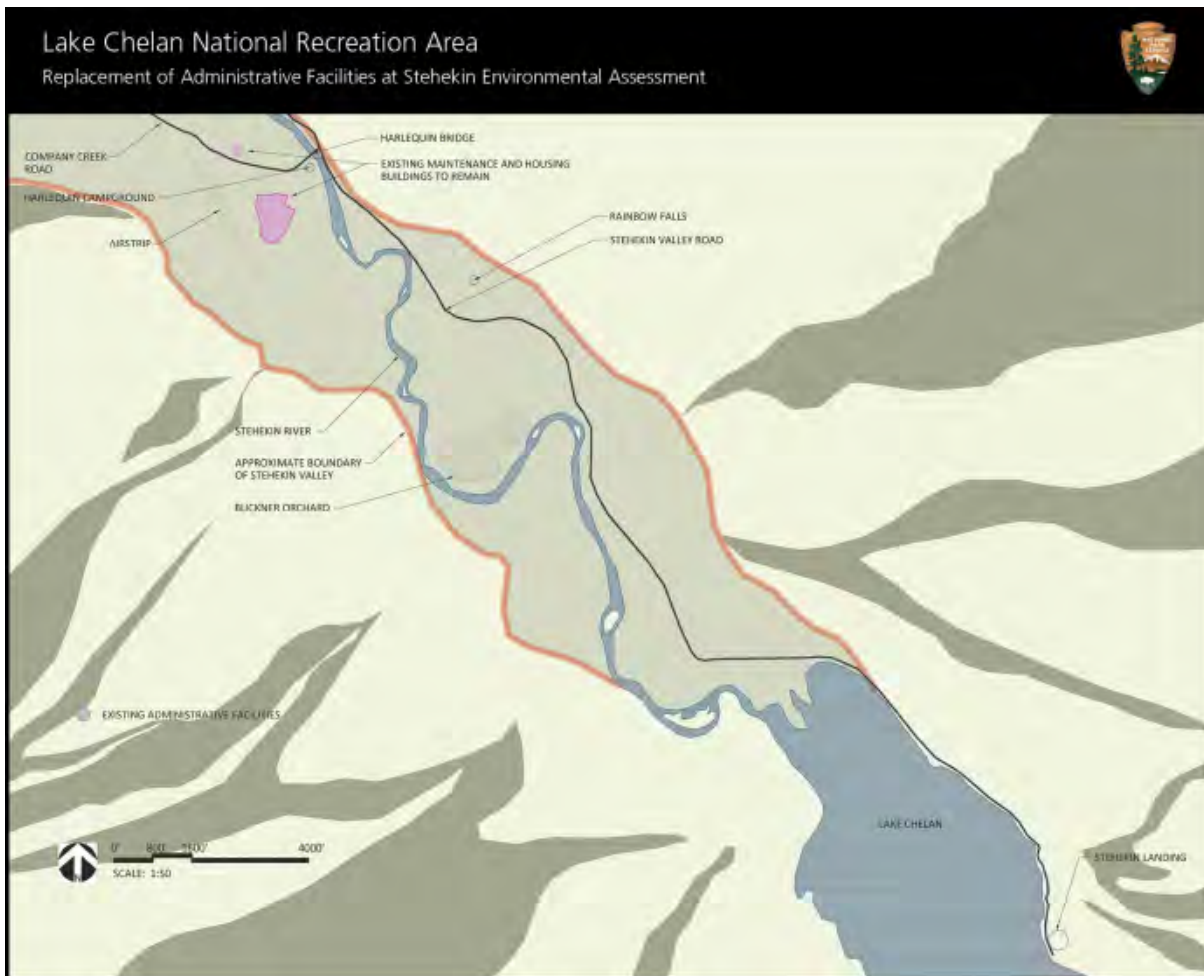


Figure 3: Alternative 1 (No Action) Existing Conditions



### **2.3.1.1 Solid Waste Handling Activities**

The NPS is currently out of compliance with federal regulations regarding the management of solid waste (see section 1.3.2, Solid Waste Handling Laws and Regulations). To address this issue, the NPS is promulgating a special regulation that would authorize collection and processing of solid waste generated by non-NPS activities in either the existing or a new/relocated transfer station. As part of the No Action Alternative, once this final rule goes into effect, the NPS would implement a new fee structure to charge non-NPS users for solid waste services at the existing NPS transfer station in accordance with the guidelines of Director's Order 35B.

Various rate structures were evaluated by NPS. The preferred rate structure was selected during a Value Analysis – Choosing by Advantages Workshop held on July 22 and July 24, 2014. The rate structure and utility rate as described in this EA are conceptual and subject to change prior to implementation.

The new fee structure would constitute a weight-based unit rate plus a fixed fee. Trash and recycled materials would continue to be dropped off by customers at the existing solid waste facility. In order to accommodate the new fee structure, NPS staff would weigh and record drop-off quantities during designated drop-off times. Recycled materials would be accepted at no charge. Rates would be charged by weight units (pounds) of trash, measured at the time of drop-off. The conceptual unit rate for full cost recovery of the operation in fiscal year 2014 is \$815.28 per ton (\$0.41 per pound). As dictated in Director's Order 35B, this rate would fluctuate annually based upon tracking the previous year's operations and maintenance (O&M) cost and tonnage. The rate model allows for an annual inflation rate that can be adjusted based on actual inflation. The conceptual rate evaluated in this EA is based upon 2013 O&M costs at the existing solid waste facility and annual units of solid waste produced.

Billing under the new fee structure would likely occur monthly based upon the total weight of trash dropped off during the month plus a fixed monthly fee. The weight-based fee for trash would cover the disposal costs for trash. The fixed fee would be charged to all customers and would cover the costs associated with recycled materials processing, transportation, and drop-off at the Chelan County Recycling Center. Fixed fees would be determined by the NPS based upon user groups (residential vs. commercial, year-round vs. seasonal, etc.). In 2013, approximately 18% of total O&M costs were spent on recycling transportation and disposal. This would equate to \$18,490.48 in fixed fees distributed to the various user groups. The distribution of fixed fees amongst user groups has not yet been determined.

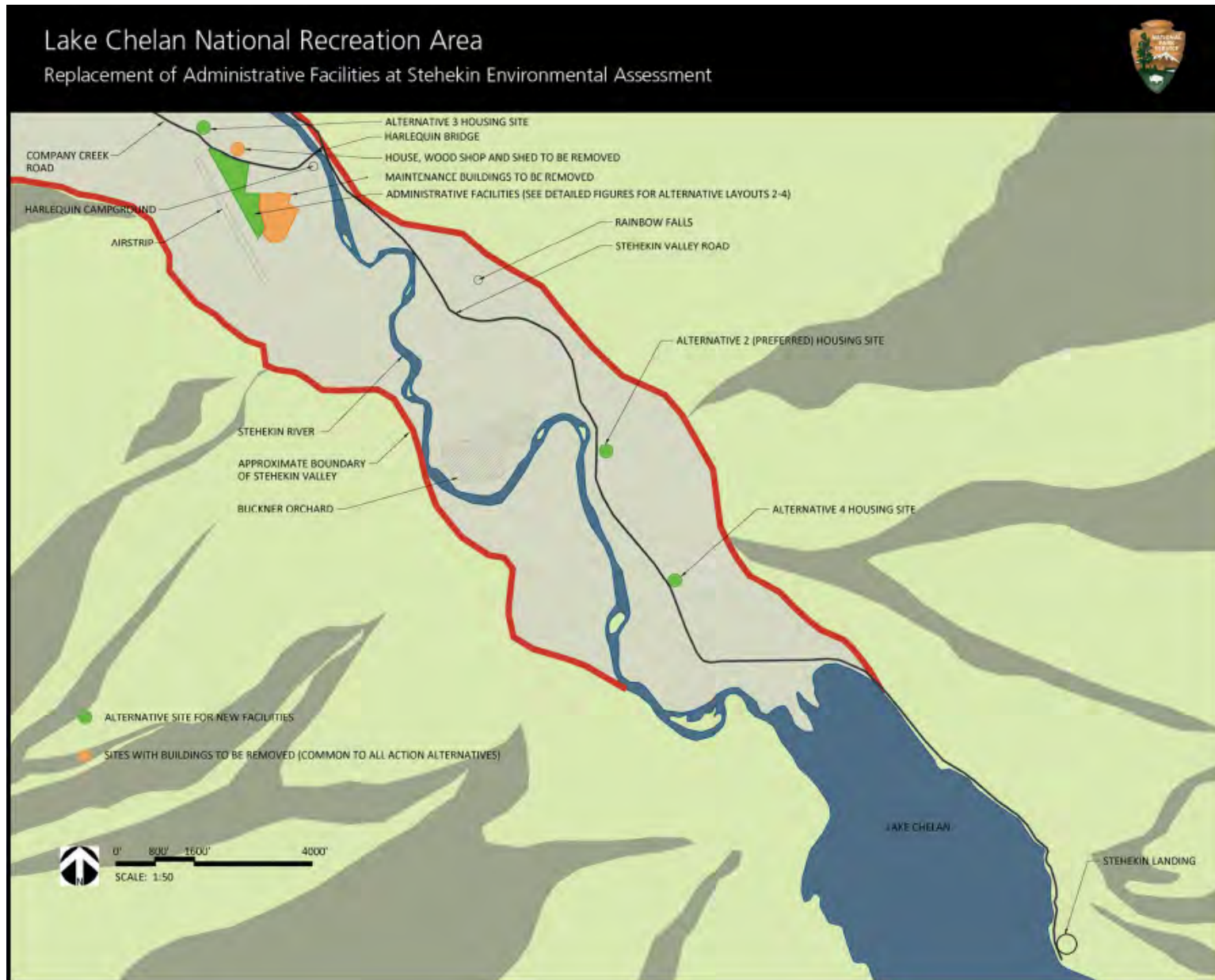
Phased implementation of cost recovery is anticipated once the rule change goes into effect to ensure that non-NPS users would experience no more than a 10% rate increase per year, based on an initial or baseline rate calculation. Utility rates would be reviewed and updated annually to reflect the 10% increase until full cost recovery is achieved.

### **2.3.2 ACTIONS COMMON TO ALL ACTION ALTERNATIVES**

Each action alternative would include a different layout for the new maintenance facility at the Stehekin Airstrip site, in combination with a different housing site within the Stehekin Valley (Figure 4). The specific layouts used in each action alternative are not mutually exclusive; each housing layout is bundled with a given maintenance facility layout as a matter of convenience, and could be organized differently.



Figure 4: Action Alternatives Overview



### 2.3.2.1 Maintenance Facility

In accordance with the 1995 GMP and SRCIP /Final EIS and Record of Decision, the existing maintenance facility would be removed from the floodplain and new maintenance facilities would be consolidated in an area near the Stehekin Airstrip. The 12.4-acre site proposed for the new maintenance facility is located approximately 4.5 miles up the lower Stehekin Valley, on the west side of the Stehekin River, off Company Creek Road. A buildable area for the proposed maintenance facilities (Figure 2) was identified during alternatives development that acknowledges identified constraints, such as the CMZ of the Stehekin River and the object free zone and setbacks associated with the Stehekin Airstrip. Development of the relocated maintenance area would include the functions and buildings identified in Table 1 below. Each action alternative would include a different layout for the new maintenance facility, offering different options for clustering the facilities and different access points from Company Creek Road and the dirt maintenance road. However, the overall size and scale of the new maintenance facility is common to all action alternatives.

**TABLE 1: PROPOSED MAINTENANCE FACILITY STRUCTURES**

Structure	Approximate Area
Maintenance facility	4,400 sq. ft.
Maintenance warehouse	3,500 sq. ft.
Fire facility	3,300 sq. ft.
Fire dorm (10-person)	3,000 sq. ft.
Solid waste compaction / recycling	2,000 sq. ft.
Gas station	900 sq. ft. (two 6,000-gallon fuel-storage tanks and dispensing facility)
Helipad	9,700 sq. ft.
Fire spike camp	4,000 sq. ft.
Total building space*	16,200 sq. ft.

\*Excludes the gas station, helipad, and fire spike camp.

The new 4,400-square-foot maintenance facility would include an auto shop, welding shop, carpenter shop, and office area with an office, conference room, and restroom. Outdoor maintenance facilities would include a covered storage structure attachment to the maintenance building with a concrete pad for miscellaneous maintenance equipment.

The new 3,500-square-foot maintenance warehouse would include a large maintenance warehouse storage area, storage area for resource management, storage area for chain saws and road crew equipment, and maintenance bay for trail crew equipment. Hazardous material storage (paint, fuel, oil, pesticide, etc.) would be a separate but adjacent 700-square-foot building. Outdoor facilities would include a covered storage structure with a concrete pad for storage of supplies and small equipment.

Both the maintenance facility and warehouse would be in year-round operation.

The layout of the maintenance facility would preserve a 2.5-acre exchange property adjacent to Company Creek Road under all action alternatives. This exchange property is owned by NPS and is being preserved for potential exchange with willing sellers of privately owned land located within the floodplain, as identified in the *Lake Chelan National Recreation Area Land Protection Plan*. The ultimate configuration of the exchange property would be determined after final design of the maintenance facility has been completed.

The NPS recognizes the environmental, health, and cost benefits of sustainable design. In compliance with Executive Orders 13514 and 13423, as well as the Pacific West Region Director's Orders 48 and 69, principles of sustainable design and high performance buildings would be incorporated into the planning, design, construction, business practices, and operation and maintenance of the facilities being built. The relocated maintenance facilities would be designed to meet a LEED rating of silver or greater under the LEED for New Construction certification system and would include associated

utility systems, including possible solar power generation. The design of the proposed new NPS facilities would have architectural components that mimic the local vernacular.

### **Fire Facility**

The new 3,300-square-foot fire facility would include a large enclosed vehicle bay for a fire engine with space for pump/saw maintenance, work benches, storage cabinets, and crew lockers. Additional elements of the fire facility would include a fire cache for equipment storage, office space, fitness area with equipment and weights for training, and men's and women's restrooms, lockers, and showers. Outdoor fire facilities would include open grounds for a spike camp (a secondary camp site for fire crews), a helipad, small hazardous materials storage building, weather station, covered area for a generator, and covered vehicle bay for a second fire engine.

The new 3,000-square-foot fire dorm would house ten people and would include kitchen, restroom, and shower facilities. Fire crews and equipment are currently housed in the "Hilton" located at the Stehekin Landing. The Hilton sleeps four people and includes a kitchen, common living area, and bathroom. The attached fire cache at the Hilton is a covered/enclosed space that provides storage for one emergency vehicle and fire equipment. A separate building provides fuel storage. The new fire dorm would be located adjacent to the new fire facility. The new fire facility and dorm would be seasonally operated during the fire season, which typically runs from May through November. With the exception of limited work that may occur during the off season such as fuels reduction, training, seasonal readiness, and close down, these facilities would not be occupied during the off season.

### **Solid Waste Facility**

The NPS would propose a rule to authorize a new solid waste transfer station on federal lands at the location of the proposed maintenance facility. As described in section 1.3.2, Solid Waste Handling Laws and Regulations, NPS would propose to replace paragraph (c) **Weapons** of the special regulations at 36 CFR Part 7.62 with a new paragraph (c) **Solid Waste**, which would authorize the siting and operation of a transfer station notwithstanding certain restrictions on solid waste disposal sites in 36 CFR Part 6. The proposed rulemaking would be a separate administrative process undertaken by the NPS. Assuming the successful development of a rule that addresses compliance issues with 36 CFR Part 6, the proposed action being evaluated in this EA is construction and operation of the new transfer station. While the specific location of the new transfer station on the maintenance facility site varies amongst the action alternatives, the size, scale, and operation of the transfer station would be the same for all action alternatives.

The new transfer station would be located within a single building and would provide enclosed operations for sorting, processing, and storage of trash and recycled materials. The new transfer station would employ contemporary environmental methods for handling waste. Operations space inside the building would include sorting and processing equipment such as table(s), container(s), conveyor belt(s), cardboard baler(s), compactor(s), glass crusher, glass pulverizer, and a can flattener. Processing of recyclables would occur within the building. Compacting roll-off container(s) would be located outside the building with potential access from within the building. If enclosed composting tubs (e.g., Earth Tubs) are included as part of the processing equipment, they may be located in an exterior covered storage area. Storage of processed materials could occur inside the building or outside in an exterior covered storage area. Mobile equipment housed within the building may include a fork lift, loader, or skid-steer. Receiving may occur outside the building, using containers for interim storage of materials or drop-off through openings in the building exterior wall. Hazardous waste disposal would occur in a small covered area adjacent to the transfer station.

The NPS would implement a new fee structure to charge non-NPS users for acceptance of solid waste at the new transfer station. The fee structure associated with the new solid waste facility would be the same fee structure as described for the No Action Alternative in section 2.3.1.1 — a weight-based unit rate plus a fixed fee. This fee structure would be designed to recover capital investment over the estimated design life of the new facility through an amortization process, in addition to the ongoing O&M costs, as described in guidance documents associated with Director's Order 35B.

Based upon the annual capital recovery rate calculated to recover the cost of relocation and construction of the new solid waste facility and an annual inflation rate of 4%, the unit rate at the new solid waste facility is projected to be 21% higher than the No Action Alternative. Assuming that the new facility is constructed in 2014, the conceptual unit rate at the new solid waste facility in fiscal year 2015 is \$1,023.83 per ton. Fixed fees would be determined by the NPS based upon the previous year's recycling costs and would be distributed amongst user groups (residential vs. commercial, year-round vs. seasonal, etc.). Assuming an inflation rate of 4% for O&M costs, projected annual fixed fees for all user groups in fiscal year 2015 is \$19,230.10 (18% of total O&M costs). However, in accordance with phased implementation guidelines associated with Director's Order 35B, any annual rate increase is capped at 10% per year, resulting in a phased rate increase over multiple years.

### **2.3.2.2 Staff Housing**

One single-family three-bedroom house would be built within the valley, outside of the floodplain and CMZ. While the location of the new house varies amongst the action alternatives, the size and scale of the house would be the same. The new residence would include approximately 1,600 square feet of gross habitable area plus a garage. The house would be designed to meet a LEED rating of silver or greater under the LEED for Homes certification system. The primary residential building would not exceed 30 feet in height and accessory buildings would not exceed 25 feet in height. The house would be of a contemporary design, construction, and color that blends with other structures within the valley. The house would be in harmony and continuity with the valley's traditional character and style, scale and orientation, color, and texture of exterior surface.

All action alternatives would also remove one single-family house and two associated outbuildings (a wood shop and a utility shed) located in the CMZ along Company Creek Road that are currently subject to flooding in the CMZ.

### **2.3.2.3 Site Restoration**

Where maintenance and housing facilities are removed, the area would be restored to more natural conditions by removing infrastructure, including buildings and foundations, septic systems, and power lines. Restoration would be representative of the surrounding undisturbed vegetation community and would include some combination of invasive species removal, soil amendment, and replanting with native plants. The existing ballfield would remain, both for continued community recreation and for intermittent use as a large spike camp during fire events.

### **2.3.2.4 Construction Activities**

Construction of the proposed actions would occur over at least two summer seasons. Construction activities are expected to begin in the early spring and continue through the following summer. Construction activity during the winter would primarily be interior work, with limited exterior work. The initiation of construction is contingent upon funding for the proposed actions. Funding of the maintenance facility may occur independently or concurrently with funding for housing, or in phases. Therefore, it is unknown at this time whether construction of the new maintenance facility and single-family home would occur simultaneously.

The anticipated sequencing of major construction events would include:

- **Site preparation.** Vegetation clearing, grading, installation of utilities, installation of foundations, and paving of selected sites for new facilities.
- **Construction.** Construct new buildings and associated facilities.
- **Relocation.** Relocate equipment and structural content from existing facilities to new facilities.
- **Demolition.** Demolish existing buildings and associated facilities. Structures to be demolished are identified on Figures 5, 7, and 9 and would include the maintenance, storage, and fuel facilities; the pole barns at the existing maintenance facility location; and a wood shop and



single-family house on Company Creek Road. Demolition material would be barged out of Stehekin for final disposal.

- **Restoration.** Restore the grounds of the existing facilities, as described above.

### **2.3.3 ALTERNATIVE 2 (PREFERRED)**

The Alternative 2 maintenance facility layout (Figure 5) separates the maintenance functions from the fire facilities, clustering the maintenance facility and warehouse, solid waste facility, equipment storage, and hazardous material and fueling areas adjacent to the Stehekin Airstrip. Direct access to the site is provided from a dirt road that connects the quarry with Company Creek Road. An improved road connects to the fire facility areas, which are clustered together to the south, adjacent to the Stehekin Airstrip.

The Alternative 2 housing site (Figure 6) is located on an inactive alluvial fan terrace on federal land. Access to the site is provided from the east side of the Stehekin Valley Road. The buildable area on the site is approximately 1.3 acres. The site falls within the existing utility line and road corridor and is near existing private housing.

### **2.3.4 ALTERNATIVE 3**

The Alternative 3 maintenance facility layout (Figure 7) separates the maintenance functions from the fire facilities, clustering the maintenance facility and warehouse, solid waste facility, equipment storage, and hazardous materials and fueling areas adjacent and south of the potential exchange property. An extended access drive is provided from Company Creek Road. The fire facility, fire dorm, helipad, and spike camp are clustered together to the northwest, adjacent to the Stehekin Airstrip.

The Alternative 3 housing site (Figure 8) is located at the base of the active Company Creek alluvial fan on federal land, directly north of the Stehekin Airstrip. Access to the site is provided from Company Creek Road. The building area on the site is approximately 1.22 acres. The site falls within the Company Creek Road and utility line corridor and is near the new maintenance facility site.

### **2.3.5 ALTERNATIVE 4**

The Alternative 4 maintenance facility layout (Figure 9) combines the maintenance functions with the fire facilities, clustering the maintenance facility and warehouse, solid waste facility, equipment storage, hazardous materials and fueling areas, and fire facilities in one area adjacent to the Stehekin Airstrip. Access to the site is provided from the dirt road that connects the quarry to Company Creek Road.

The Alternative 4 housing site (Figure 10) is located on the active Boulder Creek alluvial fan on federal land. Access to the site is provided from the east side of Stehekin Valley Road. The building area on the site is approximately 2.68 acres. The site falls within the existing utility line and Stehekin Valley Road corridor.

**Figure 5: Alternative 2 (Preferred) Maintenance Facility Layout**

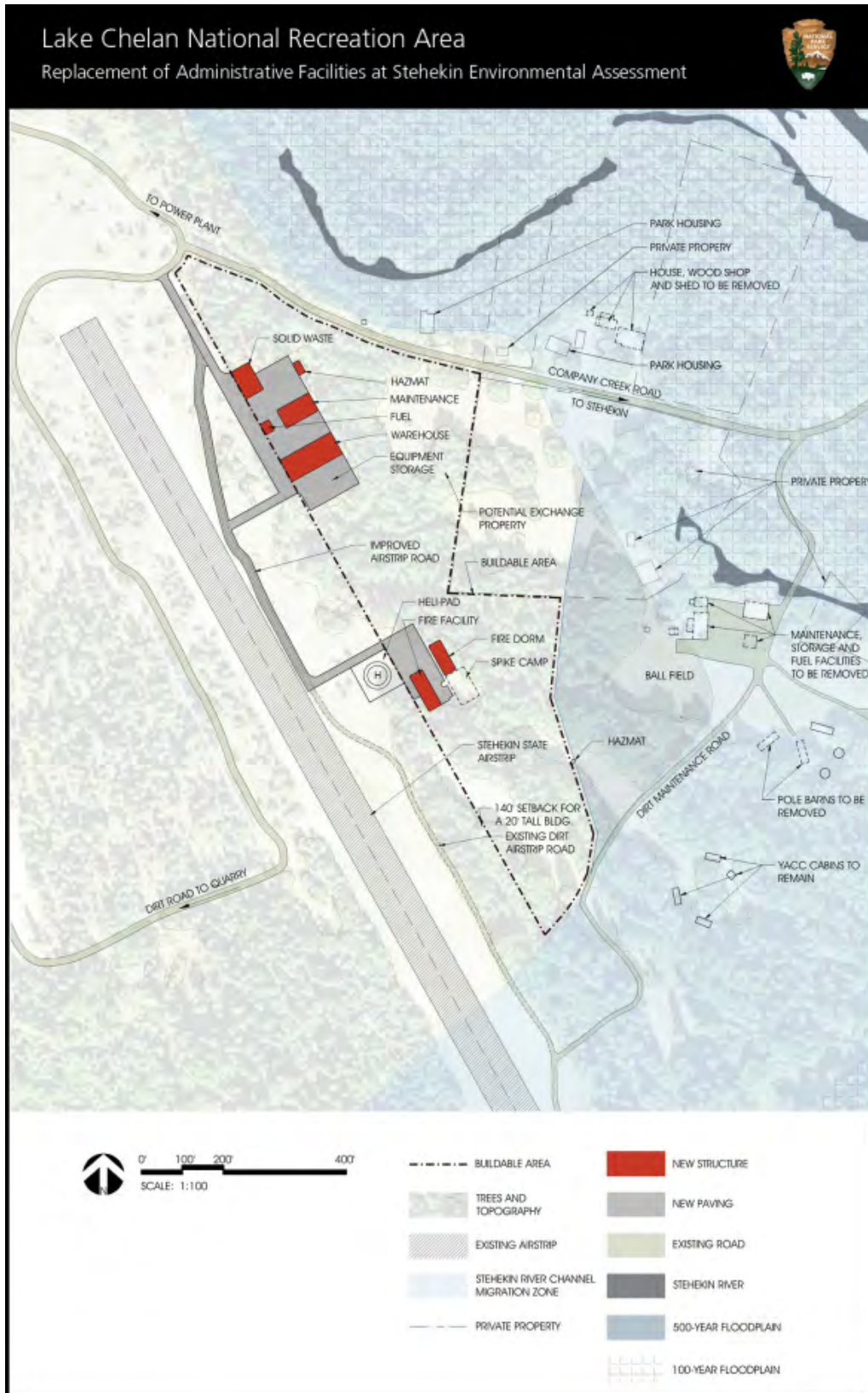
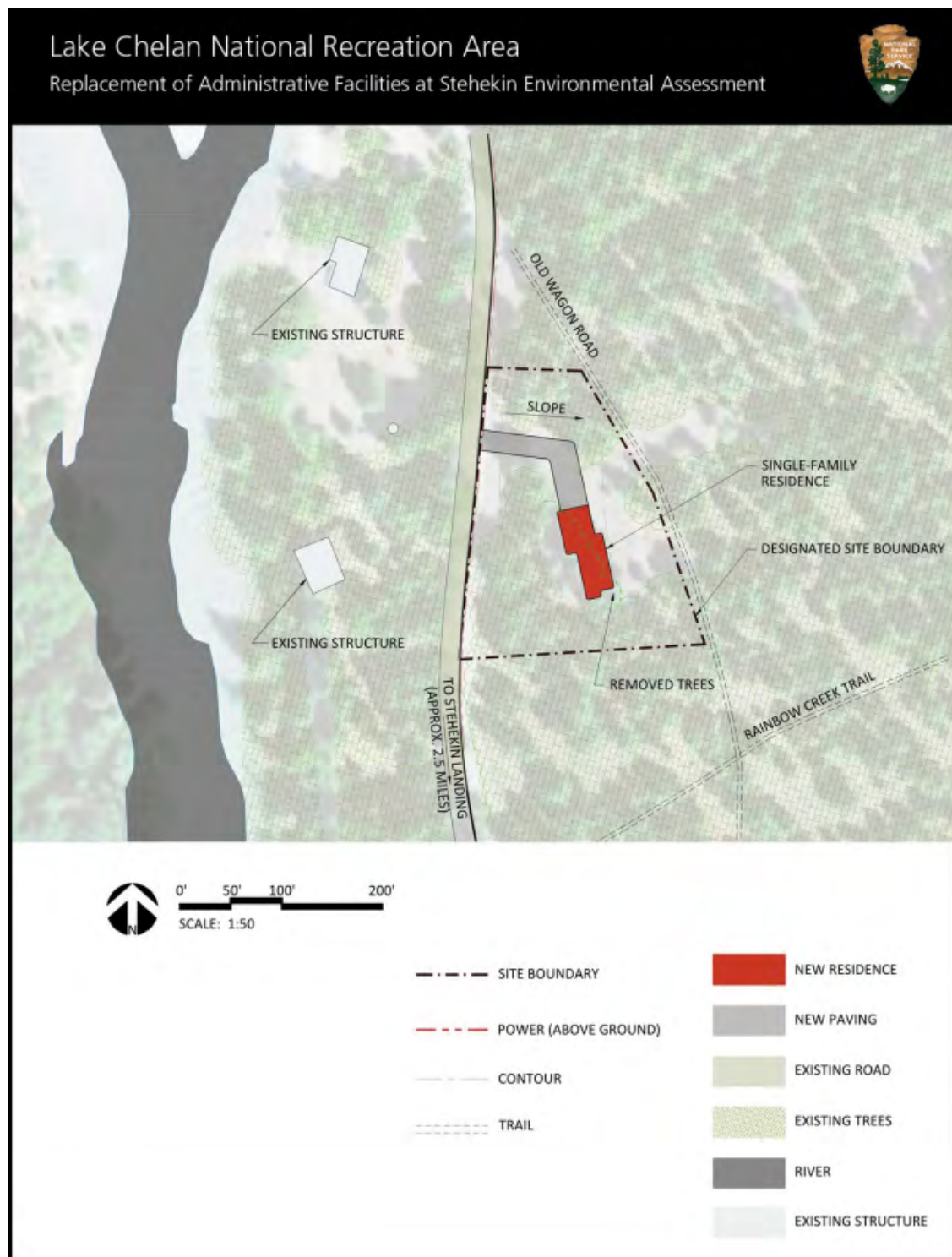


Figure 6: Alternative 2 (Preferred) Housing Site

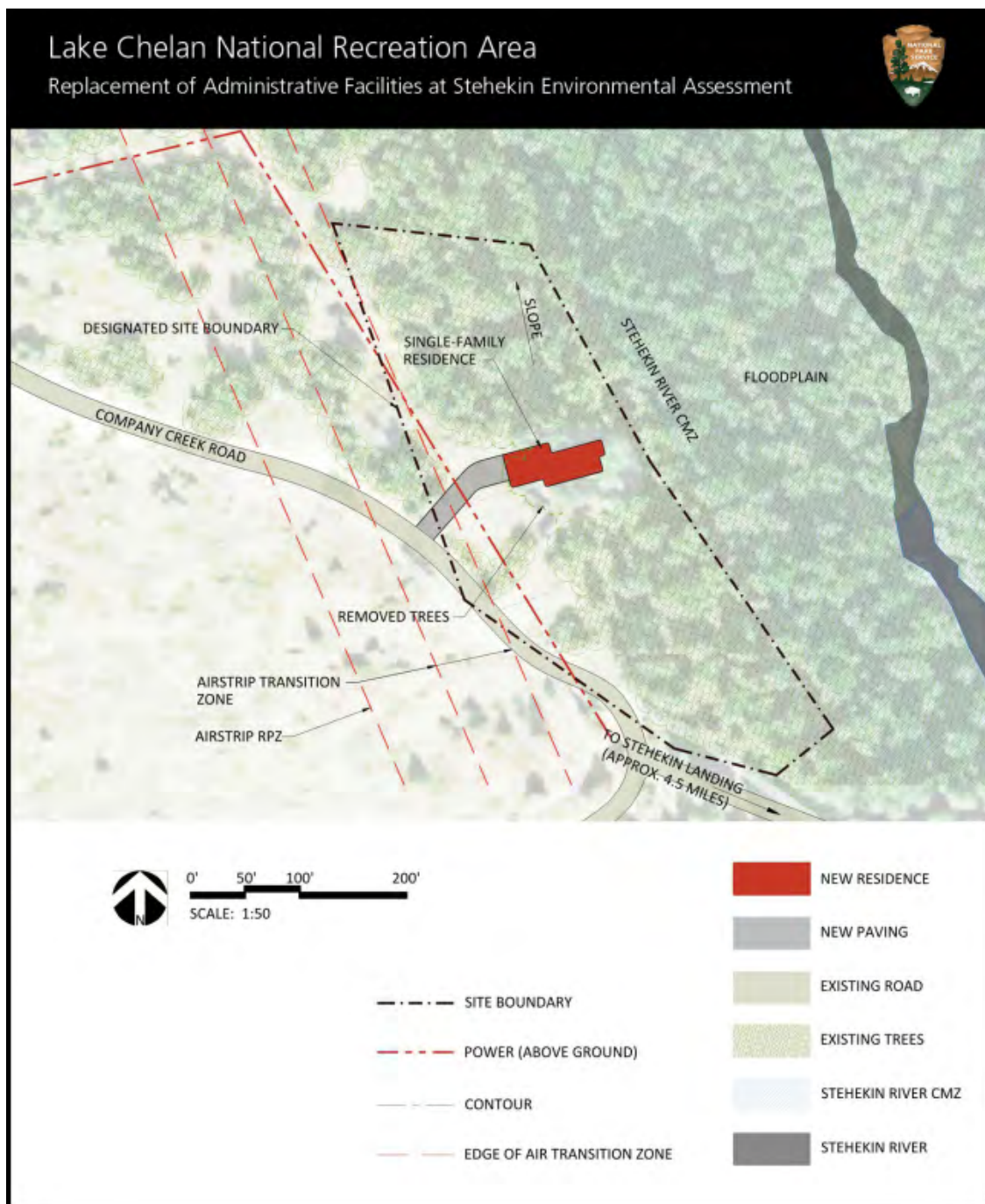




**Figure 7: Alternative 3 Maintenance Facility Layout**



Figure 8: Alternative 3 Housing Site

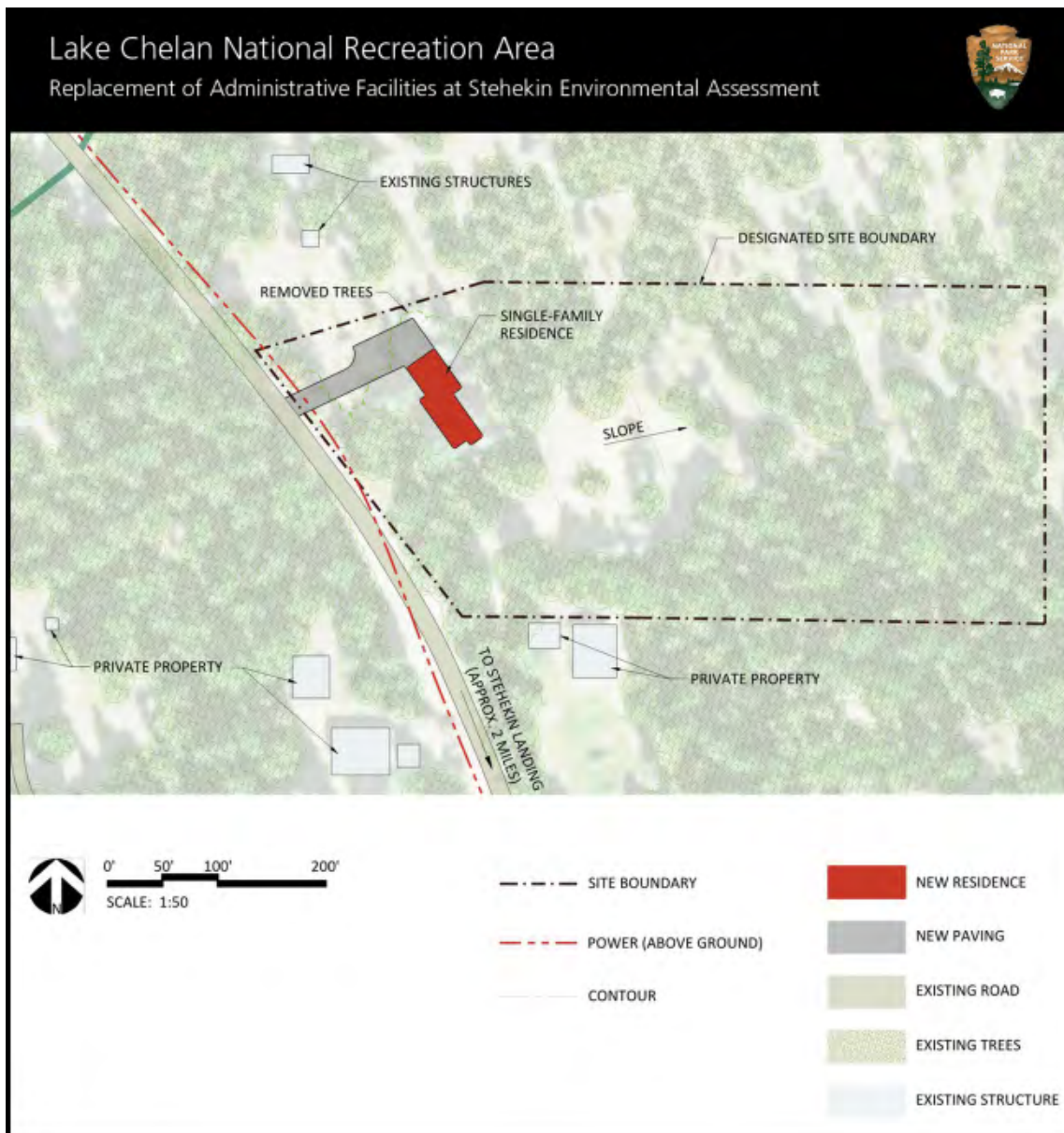




**Figure 9: Alternative 4 Maintenance Facility Layout**



Figure 10: Alternative 4 Housing Site





### 2.3.6 ALTERNATIVES CONSIDERED BUT DISMISSED

Under the NEPA (40 CFR 1502.14(a)), the President's Council on Environmental Quality's (CEQ's) Frequently Asked Questions, and NPS Director's Order 12, alternatives may be eliminated from detailed study based on the following reasons:

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

The following alternatives or layouts were considered during the design phase of the project, but because they met one or more of the above criteria, they were dismissed from further consideration. The sites dismissed from further consideration are shown in Figure 11. Site numbers listed below and shown in Figure 11 refer to those originally considered by the NPS planning team, as documented in the Predesign Document and Value Analysis Summary for Park Facilities Reconstruction and Relocation (ajc 2014a, 2014b).

- **The gravel pit site** (3.7 acres), located west of the Stehekin Airstrip, was considered as a possible location for the new maintenance facility. The site raised potential flooding concerns from Company Creek and has no utilities. Access and development of the site would also disturb a large area since there is little development in the area. The site was eliminated from further consideration because the environmental impacts would be too great and because other planning documents (e.g., 1995 GMP) identified the site east of the airstrip for the new maintenance facility.
- **Housing site 1** (0.5 acre) would include existing development, making it difficult to add new structures. Two existing septic tank drain fields occupy most of the site and limit development here. This site was eliminated as a viable location for NPS employee housing due to technical infeasibility.
- **Housing site 2** (2.61 acres), referred to as the Brownfield tract, was removed from consideration because the 2012 Land Protection Plan identifies it for possible land exchange. The site was eliminated as a viable location for NPS employee housing because it conflicts with an up-to-date, valid plan.
- **Housing site 3** (1.2 acres) was eliminated from consideration because it is close to an active portion of the Boulder Creek debris cone (geologic hazard) and has insufficient setback from the creek. The 2012 Land Protection Plan also identifies it for possible land exchange as part of Keller Park. The site was eliminated as a viable location for NPS employee housing due to technical infeasibility and because it conflicts with an up-to-date, valid plan.
- **Housing site 6** (1.8 acres) is north of a driveway that leads to a private house. It was removed from consideration because of aesthetic concerns since there is very little development visible from the road in this area.
- **The airstrip vicinity housing site** (approx. 3 acres) is located on the overall maintenance facility site. Originally, a number of different configurations of multiple houses were considered for co-location with the maintenance facility. Up to nine structures were located in this location. This alternative was dropped from consideration because (1) it was determined that housing near the maintenance area would not be desirable, (2) it created a government compound that further separated the NPS employees from the community, and (3) it has substantial impacts to forested wildlife habitat.

Figure 11: Alternative Sites Considered but Dismissed



Additionally, the park considered the option of allowing a private business or outside entity to construct and operate a solid waste transfer station to meet this need in Stehekin. However, 36 CFR Part 6 Solid Waste Disposal Sites in Units of the National Park System applies to all lands and waters within the boundary of an NPS unit, whether federally or non-federally owned. Thus, any entity interested in operating a solid waste disposal facility, including a transfer station, would require a special regulation authorizing the acceptance of solid waste from non-NPS generators; and any entity opting to construct a new facility located within the boundaries of Lake Chelan NRA would be required to meet all of the establishment requirements and siting restrictions for new facilities imposed by 36 CFR Part 6.4. Not all of the site restrictions and criteria for siting a new facility are achievable given the geographic constraints of the valley, and virtually any selected site would require a special regulation describing site-specific exceptions. While the NPS may pursue agreements or contracts to allow another entity to operate an NPS-owned solid waste facility following the rule change, the option to encourage another entity to construct and operate a solid waste transfer station was eliminated because of technical and economic infeasibility.

## **2.4 PREFERRED AND ENVIRONMENTALLY PREFERABLE ALTERNATIVE**

### **2.4.1 PREFERRED ALTERNATIVE**

The Preferred Alternative (Alternative 2) was identified at the CBA/VA Workshop held in February 2014. The workshop concluded that the Alternative 2 maintenance layout had the greatest overall advantage (ajc 2014b). This layout for the maintenance facility best resolved the efficiency of operations and was identified as the preferred alternative because it provides:

- greatest advantage with least amount of vegetation impacted
- moderate advantage with limited impact to the potentially historic water pipe
- greatest advantage with least amount of impervious improvements
- moderate advantage in providing for visitor enjoyment, with limited visibility from the road
- greatest advantage in separating the maintenance functions from the fire functions and providing the shortest distance to the fuel area
- greatest advantage with least amount of hard surface to plow in the winter
- moderate advantage with second greatest distance to nearest residence

The workshop concluded that the Alternative 2 housing site had the greatest overall advantage (ajc 2014b). This site was identified as the preferred alternative because it provides:

- greatest advantage in protecting natural resources
- some advantage with regard to density and clustering of nearby houses
- moderate advantage in the amount of vegetation disturbance
- moderate advantage in the amount of impervious surface required to access the site

### **2.4.2 ENVIRONMENTALLY PREFERABLE ALTERNATIVE**

The environmentally preferable alternative is “*the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources*” (46 FR 18026 – 18038). According to Director’s Order 12, through identification of the environmentally preferable alternative, the NPS and the public are faced with determining the relative merits of the choices before them as represented among the alternatives and must clearly state through the decision-making process what values and policies were used in reaching a decision.

All of the action alternatives have similar adverse impacts and benefits to the natural and built environment. All of the action alternatives would remove park facilities from the CMZ and floodplain,

improving floodplain function, water quality, park operations, and public health and safety. All of the housing sites are located outside the floodplain and minimize impacts to vegetation. Also, all of the alternatives avoid impacts to known archeological resources such as the Old Wagon Road. However, Alternative 2 has the least impact to vegetation, the smallest footprint for site disturbance, and the least impact to public safety because the housing site is not located on an active alluvial fan. Therefore, Alternative 2 is the environmentally preferable alternative.

## **2.5 MEASURES TO AVOID, MINIMIZE, OR MITIGATE IMPACTS**

The following measures would be incorporated into project design and construction in order to avoid, minimize, and mitigate adverse impacts to analyzed resources.

### **2.5.1 STEHEKIN RIVER CMZ AND FLOODPLAIN**

The following measures identified in the Final EIS for the SRCIP are included for this action to avoid and minimize impacts to the CMZ and floodplain of the Stehekin River:

- Locating staging and stockpiling areas away from the Stehekin River
- Delineating staging areas to prevent incremental expansion of the staging area
- Minimizing the amount of disturbed earth area and the duration of soil exposure to rainfall
- Minimizing soil disturbance and re-seeding or revegetating disturbed areas as soon as practical
- Stabilizing disturbed areas until seeding and/or revegetation takes hold
- Installing protective construction fencing around, adjacent to, or near wetland and/or riparian area adjacent to the existing maintenance to protect them during demolition activities
- Using a Storm Water Pollution Prevention Plan (SWPPP) for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction
- Developing and implementing a comprehensive spill prevention/response plan that complies with federal and state regulations and addresses all aspects of spill prevention, notification, emergency spill response strategies for spills occurring on land and water, reporting requirements, monitoring requirements, personnel responsibilities, response equipment type and location, and drills and training requirements; using an oil and hazardous materials spill prevention, control, and countermeasure plan to address hazardous materials storage, spill prevention, and responses

### **2.5.2 SOILS AND SURFICIAL LANDFORMS**

Surficial landforms are not impacted by this project, as described in section 3.2.2. The following measures identified in the Final EIS for the SRCIP are included for this action to avoid and minimize impacts to soils:

- Minimizing ground disturbance to the extent practicable
- Minimizing driving over or compacting root-zones
- Salvaging topsoil and duff from excavated areas for use in re-covering source area or other project areas
- Not leaving excavated soil alongside trees, and providing tree protection if needed for specimen trees
- Reusing excavated materials where possible in the project area
- Revegetating project areas through native seeding and planting
- Importing weed-free clean fill

- Clearing and grubbing only those areas where construction would occur

### **2.5.3 VEGETATION AND WETLANDS**

The following measures identified in the Final EIS for the SRCIP are included for this action to avoid and minimize impacts to vegetation:

- Minimize construction limits and areas to be cleared where possible
- Clearly identify the construction limits to prevent expansion of construction operations into undisturbed areas
- Salvage native plant material only, prior to construction, from areas to be disturbed; invasive plant material should be destroyed
- Restore staging and other temporarily impacted areas following construction, if necessary

Utilize Integrated Pest Management (IPM) measures to prevent the spread of noxious, non-invasive plants, which include the following:

- Import certified weed-free materials from outside Lake Chelan NRA
- Avoid the use of stockpiled materials from the Company Creek Pit unless designated for the project
- Wash all vehicles prior to barging to Stehekin; this includes all vehicles, but especially those that have come into contact with soil or materials that may contain noxious, non-native weed seed prior to working in weed-free areas or transporting weed-free materials
- Cover stored soil and rock, as appropriate, to prevent exposure to noxious weed seed
- Separate contaminated soil from weed-free soil and use the contaminated soil for subsurface fill
- Conduct annual monitoring for potential weed infestation using early detection / rapid response eradication techniques
- Identify and control exotic, non-native plant species infestations using IPM measures prior to construction (especially associated with the airstrip and old roads)

To the greatest extent possible, all proposed facilities are located in existing clearings to minimize vegetation impacts. In particular, the proposed housing footprints are located within existing clearings. Despite which alternative is chosen, NPS intends to locate the new facilities at the time of construction to maximize the use of existing clearings. The existing airstrip access road, along the east side of the airstrip, would also be maintained and improved to provide access to the new maintenance facilities and minimize development of new roads.

### **2.5.4 WILDLIFE**

The following measures identified in the Final EIS for the SRCIP are included for this action to avoid and minimize impacts to wildlife:

- Scheduling construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (e.g., bird nesting and breeding seasons) to the extent practical
- Minimizing the degree of habitat removal (vegetation clearing) by delineating construction limits
- Limiting the effects of light and noise on wildlife habitat through controls on construction equipment and timing of construction activities, such as limiting construction to daylight hours to the extent practicable

- At the end of the day, covering excavated pits and trenches to prevent animals from being trapped
- Using spill prevention measures to prevent inadvertent spills of fuel, oil, hydraulic fluid, antifreeze, and other toxic chemicals that could affect wildlife; as required by law, prepare and implement a hazardous spill plan or SPCC
- Discouraging construction personnel at work sites from providing a source of human food to wildlife, avoiding conditioning of wildlife and in human/wildlife conflicts (Title 36, CFR, Chapter 1, Section 2.10(d) prohibits anyone from leaving food unattended or stored improperly where it could attract or otherwise be available to wildlife; Title 36, CFR, Chapter 1, Section 2.14(a) prohibits the disposal of refuse in other than refuse receptacles; Title 36, CFR, Chapter 1, Section 2.2(a)(2) prohibits the feeding and molesting of wildlife)
- Maintaining proper food storage, disposing of all food waste and food-related waste promptly, in a bear-resistant receptacle, and removing all garbage off-site at the end of each working day
- Employing, monitoring and maintaining erosion control measures at construction locations to minimize sediment inputs to aquatic habitats

### **2.5.5 SPECIAL STATUS SPECIES**

The following measures are included for this action to avoid and minimize impacts to special status species:

- Conduct pre-construction survey for western gray squirrels and spotted owls within selected alternative footprint prior to construction; if active nests are found, consider implementing seasonal restrictions and/or preserving nest tree, if feasible. If spotted owls are detected, consultation with USFWS must be reinitiated.
- Storing food and garbage in wildlife-resistant containers during the day and removing all garbage off-site from project work areas at the end of each working day

### **2.5.6 VISITOR USE AND EXPERIENCE**

The following measures are included for this action to avoid and minimize impacts to visitor use and experience:

- Managing vehicle traffic and contractor hauling of materials, supplies, and equipment within the construction zone to minimize disruptions in visitor traffic (e.g., avoid traffic during the portion of the day that the ferry is docked)
- Protecting existing vegetation where possible; effective use of the existing landscape and vegetation will help to accomplish all site design goals; new vegetation should be native to the Stehekin Valley
- Minimizing noise, traffic, and dust during construction, specifically on public roadways and near residential areas (see Socioeconomic measures in section 2.5.9 below)
- Consider prefabricated wall panel construction to shorten the construction period, reduce on-site construction activities, and minimize construction waste

### **2.5.7 PUBLIC HEALTH AND SAFETY**

Measures included in the proposed project to minimize impacts to park operations would include:

- Following Federal Aviation Administration setback requirements to mitigate the risk of developing facilities near the Stehekin Airstrip, which could pose safety concerns to staff during emergency aircraft landings

- Preparing an early warning detection strategy (i.e., be aware of the severity of incoming storm events) and a robust evacuation plan for the facility to mitigate the risk of flooding and channel avulsion on the Company Creek alluvial fan
- Constructing buildings with base floor elevations raised 1 to 2 feet above ground level to accommodate flooding
- Ensuring that dry channels, which could become reoccupied, are not blocked by buildings or equipment
- Considering earthwork that could deflect or define flow routes in the event of channel avulsion

### **2.5.8 PARK MANAGEMENT AND OPERATIONS**

Measures included in the proposed project to minimize impacts to park operations would include:

- Providing and maintaining emergency vehicle access through the project area during construction
- Coordinating work with park liaison to minimize disruption to normal park activities
- Monitoring construction activities to ensure adherence to mitigation measures and provide recommendations to minimize impacts on park resources
- Using functional, energy efficient appliances, and heating and cooling systems in new buildings
- Designing efficient circulation spaces for new maintenance and housing areas
- Providing orientation about park resources for the contractor(s), including information regarding the special sensitivity of park resources and values and regulations

### **2.5.9 SOCIOECONOMICS**

Measures to minimize impacts to socioeconomics include:

- Coordinating with Stehekin businesses to increase waste diversion and recycling activities

The following stipulations are recommended for incorporation into the project contract documents to minimize socioeconomic impacts:

- Encouraging the use of local labor
- Spraying exposed soil with water to reduce emissions of fine particulate matter, smaller than 10 micrometers in diameter (PM<sub>10</sub>), and deposition of particulate matter
- Covering truck loads, wetting materials in trucks, or providing adequate freeboard space in order to reduce PM<sub>10</sub>; and deposition of particulates during transportation
- Covering dirt, gravel, and debris piles as needed
- Turning off construction equipment during prolonged periods of nonuse
- Installing mufflers on engines
- Staging equipment as far away as possible from adjacent residences

## **2.6 SUMMARY TABLES**

### **2.6.1 SUMMARY OF ALTERNATIVES AND HOW EACH MEETS PROJECT OBJECTIVES**

Table 2 describes the different actions and activities that would occur under each alternative. Table 3 summarizes how each alternative meets the objectives of the proposed action, which are described in section 1.1.5.



**TABLE 2: ALTERNATIVES COMPARISON SUMMARY**

Project Component	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
Implement New Solid Waste Fees	Weight-based unit rate (\$815.28 per ton) plus fixed fee at existing transfer station.	Weight-based unit rate (\$1,023.83 per ton) plus fixed fee at new transfer station.	Weight-based unit rate (\$1,023.83 per ton) plus fixed fee at new transfer station.	Weight-based unit rate (\$1,023.83 per ton) plus fixed fee at new transfer station.
Maintenance Facilities	Existing facilities would remain in their current position.	Existing facilities would be demolished; new maintenance facility, warehouse, fire facility, 10-person fire dorm, solid waste transfer facility, and gas station would be constructed at new location.	Existing facilities would be demolished; new maintenance facility, warehouse, fire facility, 10-person fire dorm, solid waste transfer facility, and gas station would be constructed at new location.	Existing facilities would be demolished; new maintenance facility, warehouse, fire facility, 10-person fire dorm, solid waste transfer facility, and gas station would be constructed at new location.
Maintenance Facility Layout	Layout remains the same as currently exists.	Separates maintenance functions from fire facilities.	Separates maintenance functions from fire facilities.	Combines maintenance functions with fire facilities.
Maintenance Facility Access	Access will continue unchanged, north off of Company Creek Road adjacent to Harlequin Campground.	Access would include upgrading airstrip access road.	Extended access from Company Creek Road.	Access would include upgrading airstrip access road.
Housing Facility	No change to existing housing.	Single-family, 3-bedroom residence.	Single-family, 3-bedroom residence.	Single-family, 3-bedroom residence.
Housing Site Location	No change to existing housing.	Approximately 2.5 miles north of the Landing, near the Rainbow Loop Trailhead.	Located immediately north of the airstrip across Company Creek Road.	Located approximately 2.0 miles north of the Landing, just before the road crosses Boulder Creek.
Housing Site Access	Existing access from Company Creek Road would be unchanged.	Directly from Stehekin Valley Road.	Directly from Company Creek Road.	Directly from Stehekin Valley Road.
Housing Site Area	No change to existing housing.	House and driveway footprint equals approximately 0.14 acre.	House and driveway footprint equals approximately 0.14 acre.	House and driveway footprint equals approximately 0.14 acre.

**TABLE 3: HOW EACH ALTERNATIVE MEETS PROJECT OBJECTIVES**

Project Objective	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
Remove NPS infrastructure and facilities from the CMZ and restore vacated areas	No. The existing maintenance facility and all existing NPS housing would remain in their current location in the CMZ.	Yes. All action alternatives would remove the existing maintenance facility from the CMZ and construct a new maintenance facility in an area near the Stehekin Airstrip. All action alternatives would also remove one single-family house, a wood shop, and shed located within the CMZ along Company Creek Road. Both vacated sites would be restored to more natural conditions.		
Provide low-maintenance, sustainable facilities	No. The existing, dilapidated NPS facilities would remain in their current location.	Yes. All action alternatives would incorporate principles of sustainable design and high performance into the new facilities being built, per Executive Orders 13514 and 13423 and Director's Orders 48 and 69. The new facilities would be designed to meet a LEED rating of silver or greater.		
Design and build energy efficient facilities	No. The existing, dilapidated NPS facilities would remain in their current location.	Yes. All action alternatives would design and build new facilities to meet a LEED rating of silver or greater.		
Minimize adverse impacts on park resources	No. Park facilities would remain within the floodplain, causing damage to park resources.	Yes. NPS has conducted an extensive alternative development process that has led to the selection of action alternatives that meet project objectives while still minimizing adverse impacts through appropriate site selection.		

Project Objective	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
Reduce park's maintenance backlog	No. The existing maintenance facility would remain in its current location in the CMZ.	Yes. All action alternatives would construct a new maintenance facility in a consolidated area near the Stehekin Airstrip. This would result in increased productivity because all maintenance facilities would be in a consolidated area, allowing NPS employees to access necessary equipment in a more timely fashion. A properly designed and constructed maintenance facility would also result in decreased operational costs (at least \$71,600 annually) due to savings in snow removal, maintenance, and utility costs. Consolidation of fire management operations would also allow for improved logistical coordination.		
Create architectural designs compatible with local building styles	No. The existing, dilapidated NPS facilities would remain in their current location.	Yes. All action alternatives would design the new facilities with architectural components that mimic the local vernacular.		
Minimize solid waste stream and improve efficiency of solid waste collection	No. Implementation of new fee structure and billing system and limited drop-off times would not improve operational efficiency.	Yes. All action alternatives would include construction of a new transfer station that would employ contemporary environmental methods for handling solid waste. Recycling and composting facilities are being considered to minimize the solid waste stream.		
Ensure development densities comport with zoning requirements for adjacent private land	N/A. Development densities would not change.	Yes. All action alternatives would take adjacent private land zoning into account.		

### 2.6.2 SUMMARY OF ENVIRONMENTAL IMPACTS

NEPA requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. Table 4 summarizes the potential environmental impacts of the alternatives.

**TABLE 4: SUMMARY OF ENVIRONMENTAL IMPACTS**

	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
<b>Stehekin River CMZ / Floodplain and Water Quality</b>				
CMZ / Floodplain	Minor adverse impacts from decreased flood storage and disrupted flood paths by the maintenance facility remaining in the CMZ. Minor to moderate adverse cumulative impacts.	Benefits from increased flood storage and unimpeded flood paths in the localized area vacated by the maintenance facility. Minor to moderate adverse cumulative impacts.	Same as Alternative 2.	Same as Alternative 2.
Water Quality	Ongoing minor to moderate adverse impacts, depending on the severity of any given flood event and the presence of potential contaminating materials on site at the time. Minor to moderate adverse cumulative impacts.	Negligible impacts from construction; long-term benefits from eliminating the potential for floodwater contamination by removing the facility from the floodplain. Minor to moderate adverse cumulative impacts.	Same as Alternative 2.	Same as Alternative 2.

	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
<b>Soils and Surficial Landforms</b>				
	Negligible adverse impacts to local soils and surficial landforms due to ongoing use of the existing site. Moderate adverse cumulative impacts due to soil compaction.	Minor adverse impacts to soils during construction would be minimized with BMPs. Long-term benefits to soils from moving buildings to areas with less productive soils. Negligible impacts to surficial landforms. Moderate adverse cumulative impacts due to soil compaction.	Same as Alternative 2.	Same as Alternative 2.
<b>Vegetation and Wetlands</b>				
Vegetation	Negligible impacts from ongoing use of the maintenance facility and continuing current NPS noxious weed management practices. Minor to moderate adverse cumulative impacts from past and ongoing actions.	Minor adverse impacts from removal of 2.6 acres of mixed conifer forest; long-term benefit from 2 acres of restored riparian forest. Minor to moderate cumulative impacts from past and ongoing practices.	Minor adverse impacts from removal of 2.7 acres of mixed conifer forest; long-term benefit from 2 acres of restored riparian forest. Cumulative impacts same as Alternative 2.	Minor adverse impacts from removal of 2.8 acres of mixed conifer forest; long-term benefit from 2 acres of restored riparian forest. Cumulative impacts same as Alternative 2.
Wetlands	Negligible impacts from ongoing use of the maintenance facility. Minor to moderate adverse cumulative impacts from past and ongoing actions.	Long-term benefits from restoring 2 acres of riparian and wetland buffer. Negligible cumulative impact.	Same as Alternative 2.	Same as Alternative 2.
<b>Wildlife</b>				
	Negligible impacts from ongoing use of the maintenance facility. Minor adverse cumulative impacts from past and ongoing actions.	Minor adverse impacts from removal of 2.6 acres of foraging and breeding habitat for common wildlife species; long-term benefits from restoring 2 acres of riparian forest; minor long-term disturbance impacts to wildlife. Minor adverse cumulative impacts from disturbance to small amount of habitat in Stehekin Valley.	Same as Alternative 2, except for slight increase in habitat removal by one tenth of an acre.	Same as Alternative 2 except for a slight increase in habitat removal by two tenths of an acre.

	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
<b>Special Status Species</b>				
	Negligible impacts from ongoing use of the maintenance facility. Minor adverse cumulative impacts from past and ongoing actions.	Minor adverse impacts to suitable habitat of a small subset of species, including northern spotted owl and western gray squirrel; long-term benefits to same species from restoration of 2 acres of riparian forest.  Minor adverse cumulative impacts from small localized reduction in suitable habitat for subset of species.	Same as Alternative 2.	Same as Alternative 2.
<b>Visitor Use and Experience</b>				
	Minor adverse impacts due to limitations in drop-off for transfer station customers. Minor adverse impacts (visual, odor) for residents and visitors due to potential non-compliance activities such as illegal dumping.  Beneficial cumulative impacts for visitors due to infrastructure improvements in the valley and negligible cumulative impacts for the Stehekin community.	Short term minor adverse impacts due to construction noise and activity that could be heard and seen by visitors. Minor adverse visual impacts for residents and visitors due to construction of house adjacent to the Rainbow Creek and Boulder Creek Trails. Minor adverse impacts (visual, odor) for residents and visitors due to potential non-compliance activities such as illegal dumping.  Beneficial cumulative impacts for visitor experience due to infrastructure improvements in the valley and improvements to park operations. Negligible cumulative impacts for the Stehekin community.	Same as Alternative 2, except the housing site would not impact users of the Rainbow Creek and Boulder Creek Trails.	Same as Alternative 2, except the housing site would not impact users of the Rainbow Creek and Boulder Creek Trails. Least overall traffic impact during construction since the housing site is closest to the Landing.
<b>Public Health and Safety</b>				
	Moderate risks from flooding and fire remains unchanged. Minor risk from human-wildlife conflict remains unchanged. Negligible risk from alluvial fan activity remains unchanged.  Moderate cumulative risk from flooding and fire throughout the valley.	Beneficial impacts from moving the maintenance facility and housing out of the floodplain and building a local fire facility. Minor risk from human-wildlife conflicts remains unchanged. Minor risk introduced from moving the facility onto an active alluvial fan.  Moderate cumulative risk from flooding and fire. Minor cumulative risk from alluvial fan activity.	In addition to the Alternative 2 impacts, the house would be built on an active alluvial fan introducing a minor risk to occupants.	In addition to the Alternative 2 impacts, the house would be built on an active alluvial fan introducing a minor risk to occupants.

	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3	Alternative 4
<b>Park Management and Operations</b>				
	<p>Minor adverse impacts due to implementation of fee collection, billing system, and enforcement for waste management.</p> <p>Beneficial impacts from access improvements, relocation of hazardous waste trailer, and implementation of floodproofing measures are outweighed by adverse effects of implementing the new fee collection and billing system. Cumulative impacts are minor adverse.</p>	<p>Beneficial impacts through improved working conditions, park operations, better housing conditions and waste management operations. Minor adverse impacts due to implementation of fee collection, billing system, and enforcement for waste management. Short term minor adverse impacts due to access delays and noise during construction.</p> <p>Beneficial cumulative impacts due to new maintenance facilities and infrastructure improvement projects throughout the valley.</p>	Same as Alternative 2, with additional benefits due to compliance with the GMP.	Same as Alternative 2.
<b>Socioeconomics</b>				
	<p>Minor adverse impact to businesses and residents due to implementation of new fees for solid waste management services. Cost recovery for solid waste services provided by the NPS is beneficial. Minor to moderate adverse cumulative impacts.</p>	<p>Moderate adverse impact to Stehekin businesses and minor adverse impact to residents due to implementation of new fees for solid waste management services. Cost recovery for solid waste services provided by the NPS is beneficial. Short-term beneficial impacts for local residents due to increased employment and income during construction.</p> <p>Minor adverse cumulative impacts due to the new fee structure, but less than Alternative 1 due to economic benefits associated with construction.</p>	Same as Alternative 2.	Same as Alternative 2.

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# CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 INTRODUCTION

This chapter describes existing conditions and anticipated impacts for those elements of the natural, cultural, and social environments that would be affected by the implementation of the actions considered in this EA.

According to the CEQ (40 CFR, Sec. 1502.15), “affected environment” should describe only those resources that could be affected by implementation of the alternatives. These resources were identified by a NPS interdisciplinary planning team, the public, and other agencies during the public scoping process. Resource issues identified in section 1.5 formed the basis for the impact topics that are carried forward and discussed in this chapter. The resource descriptions at the beginning of each section below serve as a baseline from which to compare the environmental effects, or impacts, of the management actions considered in the second half of each section.

NEPA requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. Each resource section analyzes the environmental impacts of project alternatives on that individual resource. These analyses provide the basis for comparing the effects of the alternatives. NEPA requires consideration of context, intensity, and duration of impacts; indirect impacts; cumulative impacts; and measures to mitigate impacts.

### 3.1.1 METHODOLOGY

The intent of this chapter is to provide a site-specific analysis of the potential social and environmental impacts of the proposed project. This project was evaluated programmatically in the SRCIP / Final EIS (NPS 2012a), but that document deferred implementation level analysis to this EA. For this reason, and because the SRCIP / Final EIS provided an excellent summary of existing conditions of most resources across the Stehekin Valley, this EA is tiered to that document. In most cases, this EA only provides a brief summary of resource conditions in the valley as a whole, but instead focuses on existing conditions and impacts specific to the project area.

Each section below includes a discussion of guiding regulations and policies; a description of existing conditions; and an analysis of direct, indirect, and cumulative impacts.

Impacts to various resources of concern from the proposed action will be determined in relation to their geographic context, type of impact, duration, area of effect, and intensity. The geographic context is described in section 3.1.2 below. The type of impact is a measure of whether the action will improve or harm the resource and whether that harm occurs immediately or at some later point in time. It is described with the following terms:

- **Beneficial:** The impact improves the resource or the quality or quantity of the resource.
- **Adverse:** The impact harms or depletes the resource or its quality or quantity.
- **Direct:** The impact is caused by and occurring at the same time and place as the action.
- **Indirect:** The impact is caused by the action, but occurs later in time, or at another place, or to another resource.

Duration is a measure of the time period over which the effects of an impact persist and may be short term (quickly reversible and associated with a specific event, such as construction, during project implementation) or long term (reversible over a much longer period or may occur continuously based on normal activity). Area of impact refers to the fact that impacts may be localized, detectable only in the vicinity of the activity, or widespread, detectable on a regional or landscape level. Finally, the impact analysis considers the intensity of the impact. In this document, the intensity of adverse impacts is measured using the following scale: negligible, minor, moderate, and major. These are



defined for each resource within the analysis sections. Intensities are not provided for beneficial impacts.

### **3.1.2 GEOGRAPHIC ANALYSIS AREA**

The geographic scope of analysis varies somewhat by resource, but in general is limited to that portion of the lower Stehekin Valley that encompasses the proposed maintenance facility site, existing maintenance facility site, the three proposed housing sites, and the structures proposed to be demolished. In the rest of this document, this area is summarized by the term “project area.”

### **3.1.3 CUMULATIVE IMPACTS**

The CEQ regulations for implementing NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “*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*” (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As stated in the CEQ handbook, “Considering Cumulative Effects” (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on effects that are truly meaningful. Cumulative impacts are considered for all alternatives, including the No Action Alternative.

Cumulative impacts were determined by combining the impacts of the action alternatives with other past, present, and reasonably foreseeable future actions. The cumulative projects addressed in this analysis include past and present actions, as well as any planning or development activity currently being implemented or planned for implementation in the reasonably foreseeable future. Cumulative actions are evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource.

Projects included in this analysis are described below. They were based primarily on projects described in the cumulative effects analysis for the SRCIP / Final EIS (Appendix 5). Descriptions of those projects are not repeated here but are included by reference (NPS 2012a).

#### **3.1.3.1 GMP & SRCIP Projects**

Projects described in the GMP and SRCIP / Final EIS were incorporated into the cumulative analysis. A description of these plans can be found in sections 1.3.1.1 and 1.3.1.2 of this document.

#### **3.1.3.2 History of Project Site**

The site of the existing and proposed maintenance facility lies on a parcel of formerly private land referred to as the “Peterson Property.” The cleared areas, including the airstrip, were intended to be a golf course. As described in the NOCA Service Complex’s Contested Terrain, Chapter 8 (Louter 1998): “[s]till another large tract acquired by the [NPS] was the Peterson property, the 100-acre fairways for a partially completed golf course, which the service converted into park housing and a utility area — home to the trash compactor building, among others.” The proposed housing sites are all located on federal land that is previously undeveloped, except for logging and utility line locations.

#### **3.1.3.3 Past Disturbance in the Valley**

Human disturbances in the Stehekin Valley have been extensive. They include selective and clear-cut logging; clearings for residences, agriculture, NPS administration, visitor facilities, golf course, road and trail system, and airstrip; gravel extraction sites; riverbank modifications; flooding of the original lakeshore and river delta; dredging and filling of wetlands; and establishment of exotic plant species. Some of these past disturbances, particularly logged areas, have returned to more natural states, although species composition may have changed. Currently, the total disturbance area is 283 acres, based on the land cover data. It is estimated that 188 of these acres, or 65%, are in the riparian zone (Riedel 1993). Other selective disturbance acreages are as follows: Buckner orchard/homestead – 42

acres; airstrip – 48; current gravel quarry – 2; lower field – 7; disturbance from firewood cutting in woodlots to date – 12 acres; estimate of vegetation lost with rise of lake level – 140 acres (Riedel 1993).

Moderate-scale logging began in the valley in the early 1890s with the beginning of steamboat service and its attendant demand for fuel (Byrd 1972). Areas in the lower valley were cut in an irregular manner with some areas resembling clear cuts (Oliver and Larson 1981). Intermittent logging continued into the 1960s, with mostly selective cuts and some small clear-cuts. Historically, at least 10 sawmills have operated in the valley, and some logs and timber were exported down lake. Three small mills still occasionally operate, cutting private timber. Based on mapped information provided by long-term resident Robert Byrd, it is estimated that over 1,650 acres, covering 65% of the valley floor study area, have been logged over the years. Most of these areas have returned to more natural, second-growth conditions.

An additional 1,400 acres of the valley floor has been impacted through the removal of snags and down logs. A total of 1,683 acres, or 66% of the valley floor, has therefore been affected by human activities. These areas are not in a pristine condition. This figure does not include historic logging activities reported earlier. If these areas are added, then 2,253 acres have been modified by human activities at some time, or 88% of the valley floor study area.

#### **3.1.3.4 Chelan PUD Power Plant**

Chelan County Public Utility District (PUD) 1 constructed a hydroelectric plant on Company Creek in 1963. This plant supplies electric power throughout the valley. The hydroelectric system is supplemented by diesel generators during the winter months when there is minimum flow.

#### **3.1.3.5 Stehekin Winter Ferry Landing Improvement Project**

In February 2010, the Lake Chelan NRA published an EA for the Stehekin Winter Ferry Landing Improvement Project (NPS 2010c). The GMP for the Lake Chelan NRA provides for improving the Ferry Landing to ensure safe and adequate docking for commercial boats, including handicapped accessibility (NPS 1995). In compliance with the GMP, the proposed action evaluated in the EA was to improve passenger safety and experience by providing year-round Americans with Disabilities Act (ADA)- and Architectural Barriers Act (ABA)-compliant universal access at the Stehekin Ferry Landing for all passengers traveling via the commercial ferry system. An important but secondary purpose was to improve passenger circulation and freight handling. The preferred alternative proposed installing a fixed walkway located atop the western bulkhead of the existing boat launch. Construction of the preferred alternative was completed in 2011.

#### **3.1.3.6 Minimize Erosion on the Upper Company Creek Road**

In September 2007, the Lake Chelan NRA published an EA to Minimize Erosion on the Upper Company Creek Road (NPS 2007). The proposed action evaluated in the EA was to install bank barbs, large woody debris, and plant riparian vegetation to stabilize the bank to reduce the risk of further flood damage on Upper Company Creek Road. The action was needed to minimize scouring and erosion on the Upper Company Creek Road while protecting the natural resources, ecosystem functions and values, and the aesthetic qualities of the Stehekin River and adjacent riparian zone. A single action alternative was evaluated in the EA. In 2007, three grade-control structures were constructed adjacent to the Company Creek Road to prevent head-cutting along the bank of the Stehekin River from affecting the Company Creek Road.

#### **3.1.3.7 Stehekin Valley Road Improvement Project**

In June 2005, the Lake Chelan NRA published an EA for the Stehekin Valley Road Improvement Project (NPS 2005). This EA included actions on five miles of the road from Harlequin Bridge to below High Bridge, including paving, reroutes (1,100 feet and 2,200 feet in length), raising of the road surface, and drainage improvements at specific locations, including repair of culverts, installation of bank protection, and installation of new barbs.

There are some measures that have not yet been implemented from the selected action in the EA that were included in all alternatives in the EIS for the Stehekin River Corridor Implementation Plan. Implementation of some portions of the Road Improvement Project EA were put on hold because immediately following the preparation of the EA, a second 100-year flood occurred on the Stehekin River in 2006 and it became clear to NPS and Federal Highway Administration staff that surfacing, rehabilitation, and raising sections of the Stehekin Valley Road were not going to be enough to prevent future damage to the roadway. As a result, the NPS began implementation of some actions from the EA, but postponed implementation of others to undertake a more comprehensive analysis of the Stehekin River corridor to determine what actions would best protect public facilities and allow continued access to private property with respect to the apparent flood regime changes on the Stehekin River.

### **3.1.3.8 Flood Protection Measures**

The NPS is planning on conducting the following floodproofing measures in the immediate future in order to protect the existing maintenance facility from future flood damage:

- Contents within the warehouse and shop would be raised 2 feet off the floor, to the extent feasible.
- Waterproof vinyl sheeting (4 feet wide) would be installed around the perimeter of all buildings. Approximately 1 foot of sheeting would be buried underground adjacent to the foundation of each structure. The remaining material would be secured to the building at the top of the sheeting. This action would prevent water from seeping through the wall, foundation connection, and doors. The door material would be removable. The material around the perimeter would be left in place.

The hazardous waste containment trailer will also be moved out of the CMZ and floodplain. NPS staff plans to implement these measures as soon as funding allows.

### **3.1.3.9 Special Regulation**

As described in section 1.1.4, the NPS is proposing to promulgate a special regulation to authorize collection and disposal of solid waste generated from non-NPS activities. This special regulation would enable the NPS to continue to accept non-NPS generated solid waste and allow a new solid waste transfer station to be constructed in a more environmentally suitable location within Lake Chelan NRA. The draft special regulation will be published in the Federal Register for public comment prior to publication of the final regulation. Once the final rule goes into effect, the NPS will implement cost recovery for providing solid waste handling services for non-NPS users in accordance with Director's Order 35B.

## **3.2 AFFECTED RESOURCES AND VALUES AND ENVIRONMENTAL IMPACT ANALYSIS**

### **3.2.1 STEHEKIN RIVER CMZ AND FLOODPLAIN**

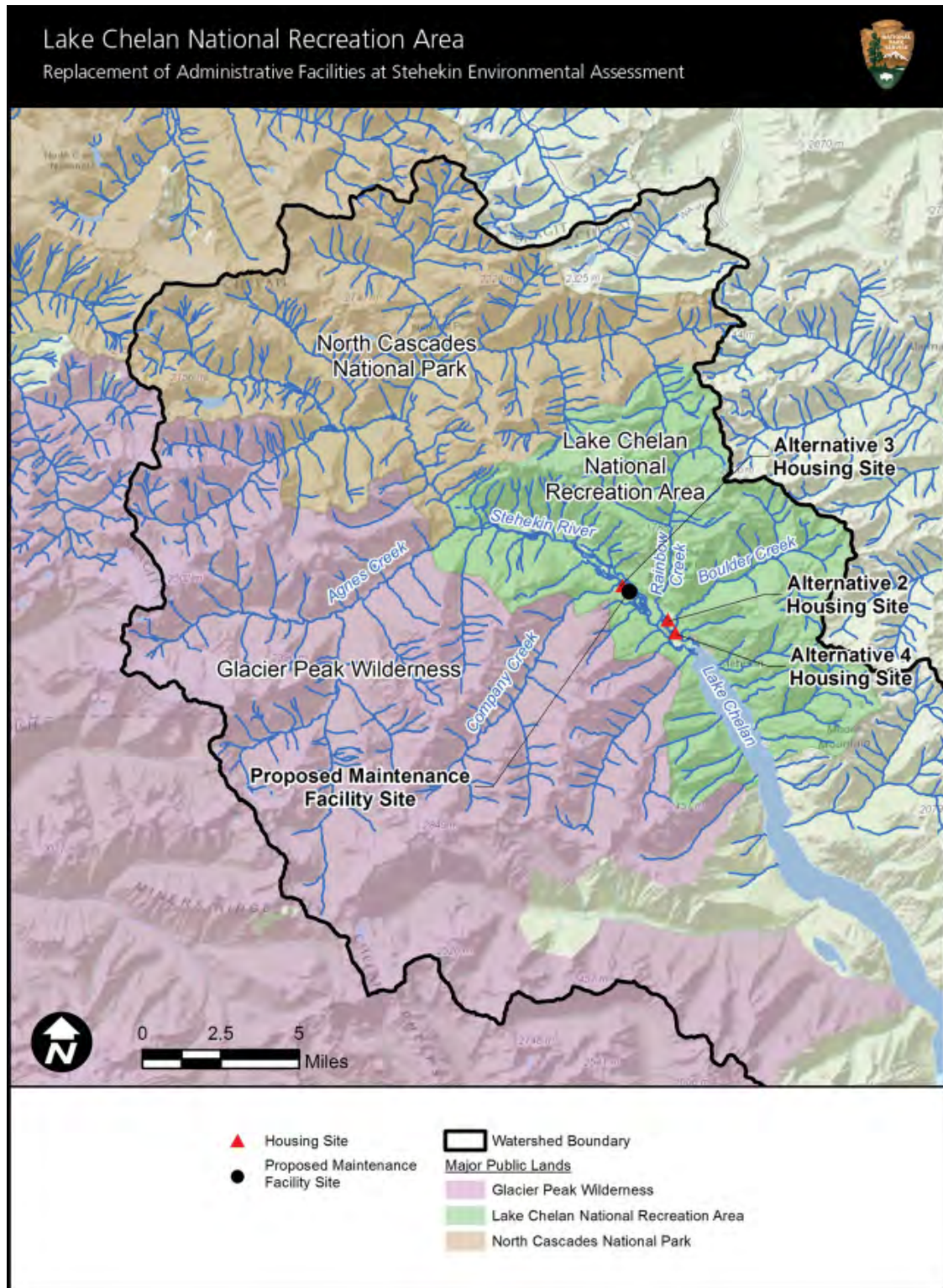
#### **3.2.1.1 Affected Environment**

##### ***Stehekin River***

The Stehekin River drains approximately 344 square miles of mostly public and undeveloped land in the Glacier Peak Wilderness Area, Lake Chelan NRA, and NOCA. Most of the watershed is designated wilderness. Major tributaries to the Stehekin River include Bridge Creek, Agnes Creek, Company Creek, Rainbow Creek, and Boulder Creek (Riedel 2007) (Figure 12).

The Stehekin River's headwaters are fed from snow and glacial meltwater along the Pacific Crest of the Cascade Range. Approximately 103 small glaciers covering about 3% of the watershed provide as much as 15% of runoff during the dry summer months (Post et al. 1971; Riedel and Larrabee 2011). Most glacial meltwater comes from the mainstem Stehekin River and Agnes Creek, which contains the Chickamin Glacier. Covering 1.8 square miles, this is the largest glacier in the watershed (Riedel 2007).

**Figure 12: Stehekin River Watershed**



Because the river's headwaters originate near Cascade Pass along the Pacific Crest, it receives the heavy precipitation characteristic of the west side of the Cascades. This location, along with steep slopes, a dense network of steep tributary streams, and the circular shape of the watershed, contributes to the frequent and rapid rise of floodwaters in the lower valley.

The U.S. Geological Survey (USGS) has been measuring flow in the Stehekin River as far back as 1911 (gage 12451000). For this period of record, mean monthly low flows (i.e., base flow) ranged from approximately 400 to 600 cfs. During summer, glacial melt buffers what would otherwise be lower flows for the Stehekin River.

The estimated discharge during floods of specific return periods has been calculated for the Stehekin River for the 10-, 50-, 100-, and 500-year floods (Table 5). Frequency estimates are based on the log-Pearson Type III analysis by the USGS Water Resources Division (NPS 2012a).

**TABLE 5: ESTIMATED DISCHARGE AND FREQUENCY OF LARGE MAGNITUDE FLOODS ON THE STEHEKIN RIVER AT USGS GAGE 12451000**

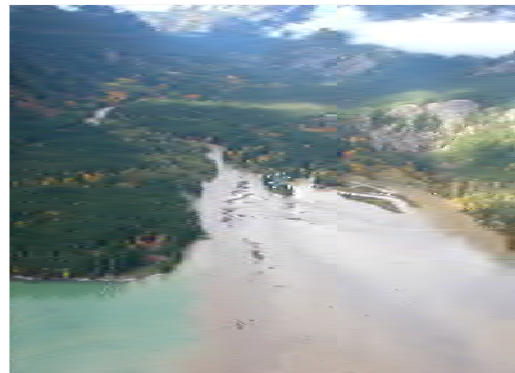
Recurrence Interval	Discharge (CFS) for Fall and Spring Floods Combined
10 years	14,570
50 years	18,400
100 years	19,920
500 years	23,270

Recent flooding on the Stehekin River has caused major changes in the river channel and its floodplain. This natural process, combined with a naturally high sediment load in the Stehekin River, has changed flood characteristics in some areas. For example, flooding of some areas is now occurring during lower flow conditions because of where the river is located in the floodplain and because of gravel accumulation in the channel. Ongoing bank erosion, as the river occupies new or former parts of its floodplain, as well as periodic mass wasting events (landslides) and loss of portions of the Stehekin Valley Road, are expected to continue.

#### **Channel Migration Zone**

The lower Stehekin Valley is relatively flat through the project area. The gradient approaching McGregor Meadows is roughly 50 feet per mile, which decreases further, down to roughly 25 feet per mile as the river approaches Lake Chelan. As a result, large quantities of sediment are deposited in this area. Over time, sediment movement through the lower valley has caused the river channel to become braided to include a network of smaller channels in addition to the main channel.

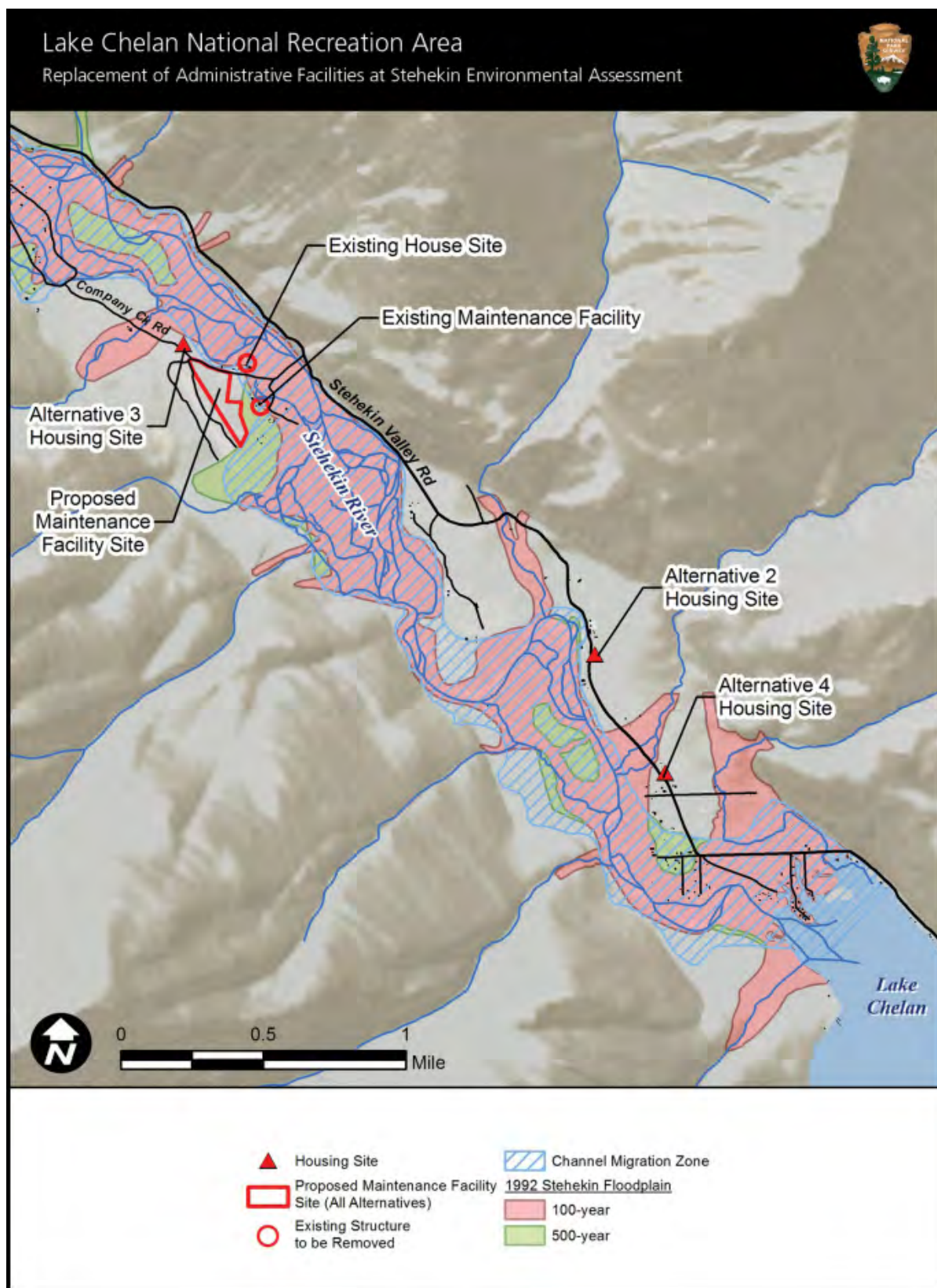
During flood events, the river over tops its channel and flows at shallow depths through the floodplain. Large floods, sediment movement, and the presence of semi-stable large woody debris make the channel and floodplain ever-changing. How far the channel can move is limited by natural features such as topography created by older glacial activity and more recent alluvial fans, and the presence of woody debris and vegetation. The CMZ is the boundary enclosing the area where the river can be reasonably predicted to move. The CMZ for the Stehekin River in the vicinity of the project alternatives is shown on Figure 13. Movement of the Stehekin River across its CMZ will continue to occur as the passage of floods and the temporary storage of gravel and large wood causes the river to periodically change course.



Stehekin River flooding.



Figure 13: Stehekin River CMZ and Regulatory Floodplains



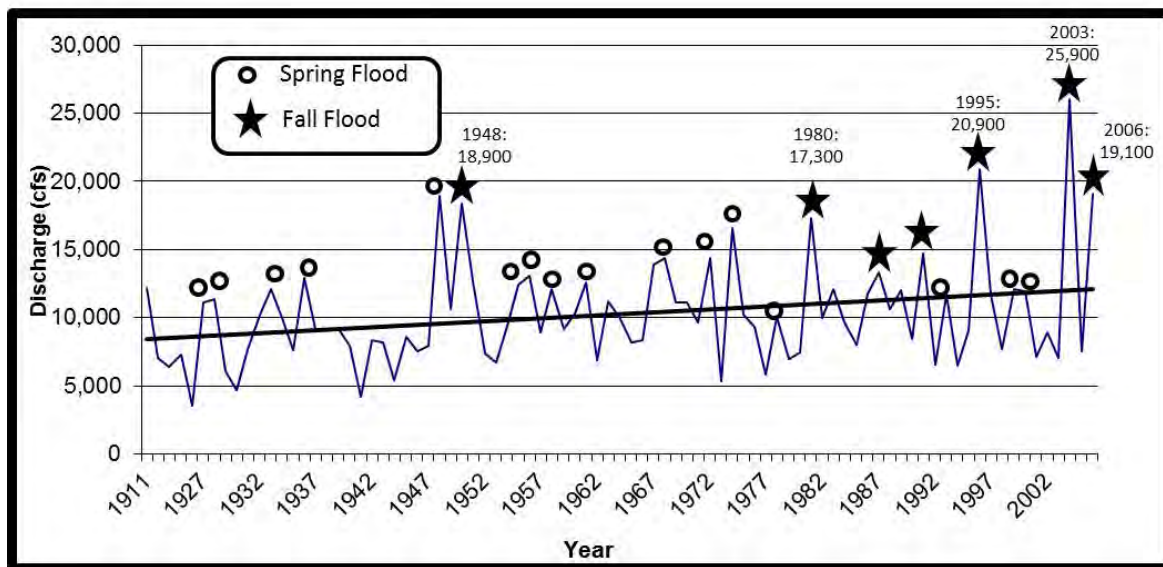
### Floodplain

The Stehekin River floodplain and existing and former flood channels comprise much of the valley floor, as shown in Figure 13. The 100-year floodplain of the Stehekin Valley has been mapped by FEMA and the NPS based on a one-dimensional hydraulic model (Riedel 1993).

The Stehekin River is subject to large and frequent flooding. The geology and shape of the Stehekin River watershed contributes to this pattern. Resistant bedrock, steep slopes, and a well-developed drainage network feed rain and snowmelt water rapidly to trunk streams. The three main branches of the Stehekin River join within 5 miles, bringing floodwaters together in deep bedrock canyons that deliver the floods rapidly to the lower valley, along with large amounts of gravel and large woody debris.

Current weather patterns appear to have moved the Stehekin River's flood hydrology toward smaller spring snowmelt floods and larger, more frequent fall rain-on-snow floods. Passage of the large floods in 1995, 2003, and 2006 has shifted the magnitude-frequency relationship toward larger, more frequent floods. This coincides with a general shift in the late 1970s from a spring snowmelt-dominated system to one dominated by fall and early winter rain-on-snow flooding (Figure 14). The shift to a fall rain-on-snow-dominated flood regime on the Stehekin River means that events like those in 1995 and 2006 may be typical for this system in the foreseeable future.

**Figure 14: Magnitude and Timing of the Annual Peak Flood on the Stehekin River**



Floods can occur at different times of the year on the Stehekin River. Spring floods occur in May or June during peak snowmelt. The magnitude of these floods varies, depending on the depth of winter snowpack and spring weather (precipitation, freezing level, and temperature). Spring floods can persist for weeks, with river levels fluctuating in response to daily cycles of snowmelt. Summer flooding occurs during thunderstorms and associated periods of intense rainfall. These floods usually affect small areas. Fall and early winter floods are larger than spring floods, but usually pass within a few days. These occur during heavy rainfall and are usually associated with unusually warm temperatures (high-elevation freezing levels) and a preexisting snowpack (rain-on-snow events) (NPS 2008).

Small, steep, first- and second-order tributaries in the valley are prone to flash flooding in summers as a result of intense convective precipitation. Those streams in southwest-facing valleys in the lower Stehekin Valley are particularly prone to debris torrents triggered by heavy rainfall.



### Water Quality

The Stehekin River is a Category I waterway under the *Water Quality Standards for Surface Waters of the State of Washington* (WAC 173-201A). Category I waterways meet testing standards for clean water and are given maximum protection under state water quality regulations. In addition, the surface water in Lake Chelan NRA has been determined to be Class AA (extraordinary). Class AA waters are also designated under state administration of the Clean Water Act and are characterized by exceptional water quality. Class AA waters are also given maximum protection under state water quality regulations (WAC 173-201A).

Although the Stehekin River is listed as Category I, it does have higher levels of arsenic than the listed standard. When investigated, these were determined to be from a naturally high background concentration of that element (Johnson and Cassidy 1997; Patmont et al. 1989). Although these natural background concentrations exceed the arsenic standard, they are natural conditions; therefore, they do not violate water quality standards.

The primary water quality concern in the project area comes from the presence of the maintenance facility within the floodplain. The maintenance facility currently stores hazardous materials including gasoline, diesel, paints, oils, and solvents. Extreme flooding has the potential to contact these substances and carry them downstream, potentially contaminating riparian soil, habitat, and Lake Chelan.



Flood conditions at existing park facilities.

In addition, erosion and the resulting suspended sediment during flooding cause increased turbidity in the river, which can adversely affect fish and other aquatic organisms in several ways. Sediment can fill the spaces within spawning gravels, which adversely affects spawning success and can also destroy other fish habitat areas such as pools used by fry and juveniles. Sediment can also clog the gills of fish, impairing respiration or causing mortality.

Despite the impacts of sedimentation and turbidity, erosion of riverbanks is a natural process, and the introduction of gravel and large wood provides a number of benefits for aquatic species, including the creation of side channels, pools, gravel bars, and logjams. Turbidity and sedimentation induced by flooding is temporary and diminishes as floodwaters recede.

#### 3.2.1.2 Guiding Regulations and Policies

Key regulations and policies that guide the management of floodplains and water quality include the Clean Water Act, Executive Order 11988 (Floodplain Management), and Director's Order 77-2 (Floodplain Management). These regulations are described in section 1.3. The *NPS Management Policies*, developed in 2006, are intended to interpret ambiguities in these guiding laws and regulations. Key intentions summarized from the *Management Policies* that are relevant to water quality, flood plains, and channel migration are provided below.

##### Water Quality, §4.6.3

*The Service will determine the quality of park surface and groundwater resources and avoid, whenever possible, the pollution of park waters by human activities occurring within and outside the parks.*

##### Floodplains, §4.6.4

*In managing floodplains on park lands, the National Park Service will (1) manage for the preservation of floodplain values; (2) minimize potentially hazardous conditions associated with flooding; and (3) comply with the NPS Organic Act and all other federal laws and executive orders related to the management of activities in flood-prone areas, including Executive Order*

*11988 (Floodplain Management), the National Environmental Policy Act, applicable provisions of the Clean Water Act, and the Rivers and Harbors Appropriation Act of 1899. Specifically, the Service will*

- *protect, preserve, and restore the natural resources and functions of floodplains;*
- *avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains; and*
- *avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risk.*

#### Watershed and Stream Processes, §4.6.6

*The Service will manage watersheds as complete hydrologic systems and minimize human-caused disturbance to the natural upland processes that deliver water, sediment, and woody debris to streams. These processes include runoff, erosion and disturbance to vegetation and soil caused by fire, insects, meteorological events, and mass movements. The Service will manage streams to protect stream processes that create habitat features such as floodplains, riparian systems, woody debris accumulations, terraces, gravel bars, riffles, and pools. Stream processes include flooding, stream migration, and associated erosion and deposition.*

### **3.2.1.3 Impact Thresholds**

#### ***River and Floodplains***

Floodplains are a very important component of any river. They slow and disperse the energy of floodwaters, providing diverse habitat for wildlife and plants that thrive on flood disturbance. Large woody debris and variably textured river sediment collects in floodplains, increasing biodiversity. As described in the Lake Chelan NRA GMP/EIS (NPS 1995), the Stehekin River floodplain performs several important functions including (1) conveying and storing floodwater, (2) storing river sediment, (3) supporting a variety of plants that provide food and habitat to a rich diversity of wildlife species (large floods may scour out an area exposing spawning gravels for fish, or conversely may pile up logs and woody debris and form a logjam that becomes cover for fish and other wildlife), and (4) providing groundwater recharge.

These natural functions can be impacted in multiple ways. The impact thresholds for floodplains consider potential impacts to floodplain values and function as well as effects to the natural severity and duration of flooding.

Impact thresholds for floodplains are defined as follows:

- **Negligible:** There would be no ongoing impacts or change in floodplain values and function. The alternative would not contribute to increased severity or duration of flooding.
- **Minor:** Ongoing impacts or changes in floodplain values and functions, would be barely measurable and local. The action alternative would not contribute to the severity and/or duration of flooding, and would not limit channel migration (the area within which the Stehekin River has migrated during the past 1,000 years).
- **Moderate:** Ongoing impacts or changes in floodplain values and functions would be measurable and local. The action alternative would contribute to the severity or duration of flooding and would limit channel movement and creation of floodplains.
- **Major:** There would be ongoing impacts or changes in floodplain values and functions that would be measurable and widespread. The action alternative would contribute to the severity or duration of flooding and would impede channel movement and creation of floodplains.

#### ***Water Quality***

Water quality standards are set by the EPA as mandated by the Clean Water Act. These standards are set for chemical, physical, and biological indicators and are intended to protect the designated use of

waters of the U.S. As measureable quantities, water quality standards provide a useful measure of impact intensity.

Impact thresholds for water quality are defined as follows:

- **Negligible:** Chemical, physical, or biological effects would not be detectable, would be well below water quality standards or criteria, and would be within historic or desired water quality conditions.
- **Minor:** Chemical, physical, or biological effects would be detectable during flooding, but would be well below water quality standards or criteria and within historical or desired water quality conditions.
- **Moderate:** Chemical, physical, or biological effects would be detectable during flooding but would be at or below water quality standards or criteria; however, desired water quality conditions would be temporarily altered for a few days or weeks after flood water recedes.
- **Major:** Chemical, physical, or biological effects would be detectable and would be frequently altered from the historical baseline or desired water quality conditions. Chemical, physical, or biological water quality standards or criteria could temporarily be exceeded.

### 3.2.1.4 Alternative 1 (No Action)

#### **Analysis**

Under the No Action Alternative, the existing maintenance facility and the existing house would remain in their present locations. These structures currently sit within the CMZ and partially within the floodplain (Figure 13).

The presence of buildings within the floodplain impacts the floodplain's function and values by disrupting flow paths and occupying floodplain storage area. However, because these effects would be localized and would not impact the intensity or duration of flooding, these impacts are deemed to be minor adverse.

Water quality can also be temporarily affected during flooding by the presence of these buildings and their contents. Buildings with septic systems are vulnerable during flooding and carry the risk of contaminating river water with sewage when they are inundated. Buildings that house hazardous materials such as oil, gasoline, petroleum products, cleaning supplies, pesticides, and other household chemicals also pose a risk to water quality during flooding. The existing maintenance facility, solid waste transfer station, fuel storage and filling area, hazardous materials trailer, and septic tanks would remain within the CMZ, continuing to pose a contamination risk during flooding. Depending on the severity of any given flood and the materials present on site at the time, the impact to water quality could vary from minor to moderate adverse, but would also be temporary.

#### **Cumulative Impacts**

As described in section 3.1.3, a variety of past projects currently have minor to moderate adverse cumulative impacts on the Stehekin River floodplain. These past development, road improvement, and erosion protection projects affect how water spreads across the floodplain and how water is conveyed downstream. These projects have also affected the ability of the floodplain to store water and to flush wetlands and side channels. Past actions having the most impacts are the erosion minimization on Upper Company Creek Road and the Stehekin Valley Road improvements. These projects contributed to cumulative impacts by placing fill at various locations in the floodplain and hardening banks that limit the natural migration of the river and the natural functions of the floodplain.

Other cumulative actions include the removal of the hazardous materials trailer from the floodplain and providing floodproofing for buildings remaining within the floodplain. The floodproofing measures will reinforce structures against flood damage, as described in section 3.1.3.8. These measures would reduce the risk of water damage to the buildings and contents; however, they would have negligible cumulative impacts to the floodplain since they would create no measurable changes to the river or floodplain functions.

The presence of the existing maintenance facility contributes to these impacts by occupying space that would otherwise be used as floodplain storage, and by limiting channel migration within the CMZ. Together, these projects have reduced the beneficial processes of off-channel flooding and channel migration, wetland formation, sediment and woody debris transport, and formation/renewal of plant and animal habitats in the riparian zone. Under the No Action Alternative, the maintenance facility would remain within the CMZ and floodplain. Alternative 1, in combination with past and future projects, would result in minor to moderate adverse cumulative impacts to the Stehekin River floodplain.

Water quality in the Stehekin River is generally excellent. The primary concerns to water quality from other sources in the valley are from septic systems and roadway runoff (NPS 2012a). Pollution from these sources has a higher risk of enter the river during flooding. During flooding, cumulative impacts to water quality from other sources could be minor to moderate adverse, but would also be temporary. Removal of the hazardous materials trailer from the floodplain would provide a small but beneficial reduction of cumulative impacts on water quality. Overall, cumulative impacts on water quality would be minor to moderate adverse during flooding.

### **Conclusion**

The No Action Alternative would have minor adverse impacts to the CMZ and floodplains because the presence of buildings that would remain in the floodplain would continue to have a local impact on function and values of the floodplain. This ongoing impact disrupts flow paths and decreases floodplain storage. Cumulative impacts throughout the valley would be minor to moderate adverse under the No Action Alternative.

Water quality impacts from the No Action Alternative could vary from minor to moderate adverse. Buildings with septic systems and hazardous chemicals such as gasoline and petroleum products would remain within the floodplain. These materials could potentially be released into river water to varying degrees depending on the frequency and severity of flooding. Cumulative impacts on water quality in the valley would be minor to moderate adverse during flooding.

#### **3.2.1.5 Alternative 2 (Preferred)**

##### **Analysis**

Alternative 2 would remove the maintenance facility and the house from both the CMZ and the floodplain. The area adjacent to the airstrip that is designated for the new maintenance facility is at the base of active Company Creek alluvial fan, which is entirely outside of both the CMZ and the floodplain. Similarly, the proposed location for the new house is on the inactive Boulder Creek fan terrace, also outside the CMZ and floodplain. Therefore, Alternative 2 provides a benefit to the floodplain.

By removing the maintenance facility buildings from the CMZ and floodplain, the buildings themselves are protected from river flooding, the floodplain function and values are improved, and the potential for water quality impacts are reduced. Approximately 1.7 acres of new impervious surface would be created under this alternative. Potential water quality impacts from runoff from this area would be offset by the removal and restoration of existing impervious surfaces at the existing maintenance facility. Runoff from the new area would also be further removed from nearby aquatic resources.

Demolition of the structures would be done when water is not present on site (i.e. not during flood season) to reduce the risk of temporary impacts from construction activities. Also, erosion control BMPs will be used during construction to minimize erosion and ensure that no turbid water leaves the construction site. A more detailed list of construction BMPs that will be implemented is provided in section 2.5.1. Upon implementation of these measures, temporary impacts from construction are expected to be negligible.

Long-term impacts to the CMZ, floodplain, and water quality for Alternative 2 are expected to be beneficial overall to these natural systems.

### **Cumulative Impacts**

See the No Action Alternative above for discussion of past and future actions contributing to cumulative impacts along the Stehekin River.

Alternative 2 would remove all the facility buildings and one house from the CMZ and floodplain, contributing beneficial cumulative impacts to the CMZ, floodplain, and water quality. However, these benefits are relatively small compared to the continued presence of roads, levees, septic systems, and erosion control measures currently contributing the largest portion to cumulative impacts along the river. Therefore, while somewhat reduced, cumulative impacts in the valley would remain at a level of minor to moderate adverse.

### **Conclusion**

Temporary impacts from construction activities are expected to be negligible because erosion control BMPs would be employed on site to prevent erosion and sediment transport while soil is exposed.

Alternative 2 is expected to benefit the Stehekin River CMZ and floodplain by removing the maintenance facility and one house from the CMZ and floodplain entirely and restoring the function and values of the floodplain in the vacated area. Similarly, Alternative 2 is expected to benefit water quality because sources of potential contamination would be removed from the CMZ and floodplain. While this alternative improves conditions for the CMZ, floodplain, and water quality, cumulatively throughout the valley the effects of other projects would remain minor to moderate adverse on these resources.

#### **3.2.1.6 Alternative 3**

Alternative 3 would have the same impacts as those described for Alternative 2. The difference between these alternatives is in the planned layout at the new maintenance facility location and the location of the housing site. For Alternative 3, the housing site is also on the active Company Creek alluvial fan, not far from the maintenance facility. The building layout does not change the impacts any of the action alternatives would have on the CMZ, floodplain, or water quality. Therefore, the analysis, cumulative impacts discussion, and conclusion for Alternative 3 would be the same as those described for Alternative 2.

#### **3.2.1.7 Alternative 4**

Alternative 4 would have the same impacts as those described for Alternative 2. The housing site for Alternative 4 is on the active Boulder Creek alluvial fan. The analysis, cumulative impacts discussion, and conclusion for Alternative 4 would be the same as those described for Alternative 2.

### **3.2.2 SOILS AND SURFICIAL LANDFORMS**

#### **3.2.2.1 Affected Environment**

Soils and surficial landforms in the Stehekin River Valley have developed as a result of a variety of past and ongoing geologic events and processes, including uplift and metamorphism of the North Cascades mountain range; repeated, intense glaciation; landslides; and flooding.

The Stehekin Valley is located in the Chelan Mountains terrane, an area bounded by faults that has a distinct bedrock geology and history from adjacent areas. This terrane contains rocks that originated both from the ocean and from volcanic activity. Through intense heat and pressure (metamorphism), these former oceanic rocks have recrystallized into the metamorphic Skagit Gneiss, which is the primary bedrock in Lake Chelan NRA. Sedimentary and volcanic rocks were also metamorphosed into mica schists. In many places these older metamorphic rocks were intruded by younger granite.

The Stehekin Valley is carved out of the Skagit Gneiss complex, known as the crystalline core of the North Cascades. These quartz- and feldspar-rich rock types provide abundant amounts of sand and gravel to the Stehekin River system. Relief within the watershed varies from 9,511 feet above mean sea level at Bonanza Peak to a low of 350 feet below mean sea level in Lake Chelan, making the valley one of the deepest gorges in North America. Below High Bridge, the Stehekin River and Agnes

Creek emerge from deep box canyons into the broad lower Stehekin Valley (Figure 15). This part of the valley was glaciated by both alpine glaciers and the massive Cordilleran Ice Sheet. During multiple ice ages these glaciers created the valley's characteristic U shape, straight profile, and flat valley floor. On the southwest side of the valley, glaciers from the last ice age left a long, lateral moraine feature 14,000 years ago that can be traced from the Stehekin Valley Ranch to the Buckner Orchard.

### **Soils**

Soils in the lower valley have been significantly influenced by the movement of the Stehekin River within its CMZ as it continues to shape floodplains, terraces, and alluvial fans in the project area. Major soil orders in the valley include Entisols, Inceptisols, Spodosols, and Andisols. Soils in the Stehekin Valley are generally young, shallow, and course grained, having developed in sand and gravel deposited recently by streams and gravity. They also lack cohesion, are resistant to compaction, and, if sandy, are prone to rapid rates of erosion (NPS 2012a).

Soils underlying the existing maintenance facility are primarily a Mesahchie-Inspiration-Lyall complex. Soils underlying the proposed maintenance facility location are mostly a Farway-Lyall-Inspiration complex.

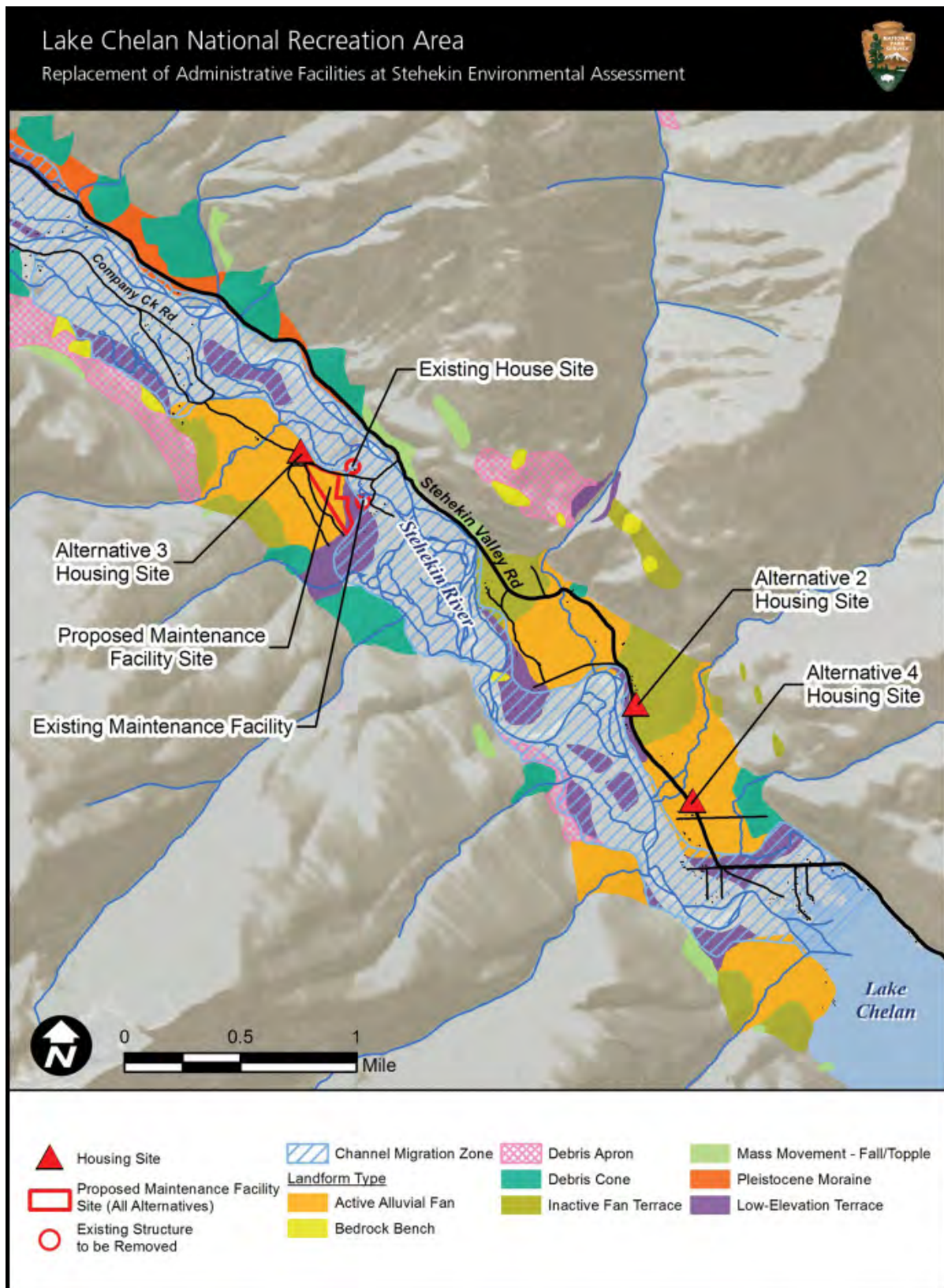
### **Surficial Landforms**

The Stehekin River channel in the lower valley is incised 10 to 15 feet within sand and gravel terraces. Extensive alluvial fans deposited by major tributaries — Company, Boulder, and Rainbow creeks — define the area in which the Stehekin River has meandered. The alluvial fans themselves have older inactive upper terrace surfaces (fan terraces) that have presumably not been affected by flooding for a very long time, and represent appropriate sites for development to avoid flooding from the river or its tributaries. Below the Buckner Orchard, the lower valley is underlain by a thick silt and clay layer that represents the former bed of Lake Chelan. Evidence uncovered by the NPS indicates that the Stehekin River met Lake Chelan just below Buckner Homestead hayfield and pasture 9,000 years ago. Private cabins sit on a layer of thick gravel over fine sand and silt that was the river delta at that time. Down valley of the delta deposit, the silt and clay from deeper parts of the former lake bed are exposed near the surface in low-lying areas near the river, and at depths of 25 to 30 feet, as documented in well logs from sites on the Boulder Creek and Rainbow Creek fans (NPS 2012a).

The existing maintenance facility and house do not sit on an active alluvial fan, or an inactive fan terrace. The proposed maintenance facility site is located on a lower, active portion of the Company Creek alluvial fan, which is dominated by a combination of coarse rock, gravel, and sand deposited within the past few hundred years. The housing site for Alternative 2 is located on the inactive fan terrace between Boulder Creek and Rainbow Creek; the housing site for Alternative 3 is located on the active Company Creek alluvial fan near the proposed maintenance facility; and the housing site for Alternative 4 is located on the active Boulder Creek alluvial fan (Figure 15).



Figure 15: Surficial Landforms in the Lower Stehekin River Valley



### 3.2.2.2 Guiding Regulations and Policies

Few regulations directly protect soils and surficial landforms. However, protecting these resources is an indirect part of protecting habitat for plant and animal species. From this perspective, the most pertinent guiding regulations and policies for soils and surficial landforms are noted below.

The following section of the 1995 GMP (see section 1.3.1.1) and its associated Implementation Plans provide the policy guidance relevant to erosion control measures:

- *Sand, Rock, and Gravel Plan: Sand, rock, and gravel will be conserved and recycled whenever possible...To ensure conservation of sand, rock, and gravel, the National Park Service proposes to limit the use of in-part material to 1,400 cubic yards per year: 1,200 cubic yards for NPS use and 200 cubic yards per year for private use over a proposed 10-year excavation cycle...In the event of a large flood, the remaining 10-year stockpile could be used in one year...The superintendent will have the option to exceed the established limit in the event of an emergency such as a major flood.*

The Natural Resources Management Reference Manual #77 provides comprehensive guidance to NPS employees responsible for managing, conserving, and protecting the natural resources found in national parks. This Manual serves as the primary Level 3 guidance on natural resource management in units of the NPS, replacing NPS-77, The Natural Resource Management Guideline, issued in 1991 under the previous NPS guideline series.

The policy of the Soil Resources Management section of the Manual seeks 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.”

The program objectives are to:

1. *Preserve intact, functioning, natural systems by preserving native soils and the processes of soil genesis in a condition undisturbed by humans to the extent possible.*
2. *Maintain significant cultural objects and scenes by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.*
3. *Protect property and provide safety by working to ensure the development and their management take into account soil limitations, behavior, and hazards.*
4. *Minimize soil loss and disturbance caused by special use activities and ensure that soils retain their productivity and potential for reclamation.*

### 3.2.2.3 Impact Thresholds

Activities that result in soil impacts include the construction of buildings or structures, parking areas, roads, trails, and other facilities. Adverse impacts to soils include soil removal, profile mixing, compaction, erosion, and contamination. Adverse impacts would degrade chemical or physical properties of soils or result in the loss or temporary removal of soils. Beneficial impacts result from actions that protect soils from erosion or restore natural soil conditions. Restoration and revegetation have both adverse and beneficial effects.

- **Negligible:** The effects to soils and landforms would be generally undetectable. Any effects to soil productivity or fertility would be slight and no long-term effects to soils would occur. Any effects to surficial landforms (e.g., Company Creek alluvial fan) and the associated natural processes that form them would be undetectable.
- **Minor:** The effects to soils would be detectable and would include loss of organic surface horizons. Effects to soil productivity or fertility and the area affected would be small. Local landforms would be affected at the surface, but substantial intrusion would be avoided. Natural processes that form them would remain unaffected.

- **Moderate:** The effect on soils would be readily apparent and likely long term, and would potentially include loss of subsurface soil horizons. Impacts would result in a change to the character of the resources over a relatively wide area, or in changes to a rare or sensitive soil. Changes to local landforms and the processes that form them would be long term and permanent.
- **Major:** The effect on soils would be readily apparent and long term, and would cause soil erosion over large areas (or over small areas, if a particularly rare soil type is threatened). Local landforms and natural processes would be widely affected over the long term.

#### 3.2.2.4 Alternative 1 (No Action)

##### **Analysis**

The No Action Alternative would result in no soil disturbance because no construction is necessary for this alternative. Similarly, local landforms would be unaffected by this alternative. Therefore, Alternative 1 would have negligible impacts to soils and landforms.

The No Action Alternative does not address concerns regarding potential contaminants that would remain at the existing maintenance facility location. Materials stored on site such as heavy equipment, paints and solvents, fuel, solid waste, and septic fields have the potential to be released into the environment during flooding. If released, these materials can contaminate soil, both on-site and downstream of the facility. Because of the relatively small quantities kept on-site, contamination during flooding is expected to be temporary, if it were to occur at all.

##### **Cumulative Impacts**

Past projects, as described in section 3.1.3, currently have a moderate adverse cumulative impact to soils within the Stehekin Valley. Road projects, such as Company Creek Road and Stehekin Valley Road, have impacted soils by compaction, limiting subsurface water movement and removing area from vegetated production. The presence of the maintenance facility contributes to these impacts by covering and compacting soil that would otherwise support vegetation. However, due to the size of the facility relative to impacts from roadways, the contribution to cumulative impacts is minor.

Under the No Action Alternative, the maintenance facility would remain within the CMZ and floodplain. Alternative 1, in combination with past and future projects, would result in moderate adverse cumulative impacts to Stehekin Valley soils.

##### **Conclusion**

The No Action Alternative would result in little to no soil disturbance and is, therefore, considered to have negligible impacts to soils and landforms. Alternative 1 would result in moderate adverse cumulative impacts.

#### 3.2.2.5 Alternative 2

##### **Analysis**

During construction, the maintenance facility site would need to be selectively cleared and graded, based on the chosen layout, to accommodate new buildings. During construction, erosion control BMPs would be employed to reduce erosion, minimize the release of turbid water from the construction area, and diminish the generation of fugitive dust. A more detailed list of specific BMPs that will be used to protect soils can be found in section 2.5.2. Impacts from construction are expected to be minor because construction activity would be very localized and temporary.

Construction impacts to soils would be similar at the housing site as they are at the maintenance facility. The site would be cleared and graded for construction of the building. Construction BMPs would be used on site to reduce effects of soil disturbance resulting in a minor, temporary impact. Once construction is complete, remaining bare soils would be stabilized with vegetation or gravel.

Long-term effects from the presence of the maintenance facility and the house include soil compaction and soil covering that reduce pore space within the soil matrix, reduce infiltration, and remove the

covered area from production. However, these minor adverse impacts are expected to be offset by the removal of buildings and the restoration of soil at their existing locations. The soil type at the existing maintenance facility is typically more productive than soil at the proposed site. Therefore, restoring the existing site is considered a beneficial overall improvement. In addition, Alternative 2 would have the benefit of removing hazardous materials from the floodplain, which pose a contamination risk to soils.

The maintenance facility proposed under Alternative 2 would be built at the edge of the active Company Creek alluvial fan. The presence of the facility is not expected to impact the alluvial fan. However, for a discussion of how the alluvial fan may impact the facility, see section 3.2.7 Public Health and Safety. The housing site for Alternative 2 is on an inactive fan terrace that poses no geologic hazards.

### ***Cumulative Impacts***

Alternative 2 would construct new buildings with minor, localized impacts to soils. These impacts would be offset by the restoration of existing building locations that would be vacated and restored. Because the minor impacts at the proposed sites are offset by restoration of the existing site and area with better soil conditions, Alternative 2 provides a cumulative benefit to soil in the Stehekin Valley. Alternative 2, in combination with past and future projects, would result in moderate adverse cumulative impacts.

### ***Conclusion***

Alternative 2 would have minor effects from clearing, grading, and the construction of new buildings. These effects would be offset by the use of BMPs during construction. Long-term effects would be beneficial due to the restoration of the existing building locations following demolition. Alternative 2 also reduces the risk of soil contamination during extreme flooding. Both temporary and long-term impacts to the Company Creek alluvial fan would be negligible. The overall cumulative impact in the valley would be moderate adverse.

#### **3.2.2.6 Alternative 3**

Impacts for Alternative 3 are expected to be the same as those described for Alternative 2. The housing site for Alternative 3 is on the active Company Creek alluvial fan. The presence of the facility is not expected to impact the alluvial fan. However, for a discussion of how the alluvial fan may impact the facility, see section 3.2.7 Public Health and Safety. Cumulative impacts and conclusions for Alternative 3 would be the same as those for Alternative 2.

#### **3.2.2.7 Alternative 4**

Impacts for Alternative 4 are expected to be the same as those described for Alternative 2. The housing site for Alternatives 4 is on the active Boulder Creek alluvial fan, but is not expected to impact this landform. Cumulative impacts and conclusions for Alternative 4 would be the same as those for Alternative 2.

### **3.2.3 VEGETATION AND WETLANDS**

#### **3.2.3.1 Affected Environment**

##### ***Vegetation***

Vegetation in the Stehekin Valley has been shaped by the diverse natural processes and human activities in the valley, including the regular flooding of the Stehekin River, landslides, and forest fires. A vascular plant survey of the NOCA between 2000 and 2008 (Bivin and Rochefort 2010) produced a plant list with more than 1,380 species on it. These surveys included a plant survey of the Stehekin Valley and surrounding area in 2006, which collected 836 specimens representing 244 species. Appendix 8 of the SRCIP / Final EIS (NPS 2012a) contains a list of vascular plant species observed at the alternative sites in the valley.

Approximately 2,543 acres within the Stehekin Valley (below the 1,640-foot wilderness boundary elevation contour) was classified by Tanimoto (1991, with revisions by NPS in 1992) into 36 different vegetation cover types associated with five different soil moisture / nutrient condition categories (NPS 1995).

The five soil moisture / nutrient condition categories are:

- Riparian – Nutrient Poor
- Riparian – Nutrient Rich
- Upland Mesic (moderate moisture)
- Upland Xeric (dry)
- Miscellaneous

Of these 36 cover types, the alternative sites are located in only two of them — mixed coniferous and mixed coniferous/deciduous. Both of these cover types are associated with nutrient rich riparian zones, which is consistent with the location of all of the proposed facilities, which are all in relatively close proximity to the Stehekin River or one of its tributaries (but not within the CMZ) (Figure 16).

Based on site observations, plant community composition at the proposed maintenance facility location includes Douglas fir, ponderosa pine, bigleaf maple, and cottonwood in the overstory; and grand fir, ocean spray, Oregon grape, and various grasses and forbs in the understory. Tree size on the proposed maintenance facility site ranges from less than 6 inches diameter at breast height (dbh) to more than 40 inches dbh.

Plant community composition at the proposed housing sites is most varied at the Alternative 3 site, which is closest to the riparian zone of Company Creek and the CMZ of the Stehekin River. Vegetation at this site has also been disturbed by roadside maintenance along Company Creek Road and clearing underneath an overhead powerline.

Within the powerline easement, vegetation is characterized by shrubs, including ceanothus (*Ceanothus* sp.), Oregon grape (*Mahonia aquifolium*), bigleaf maple (*Acer macrophyllum*), and ocean spray (*Holodiscus discolor*). Alternative housing sites 2 and 4 have similar plant community composition, with Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) dominating the overstory; and western yarrow (*Achillea millefolium*), bluebells (*Mertensia* sp.), ocean spray, ceanothus, pinegrass (*Calamagrostis rubescens*), serviceberry (*Amelanchier alnifolia*), and Oregon grape in the understory.

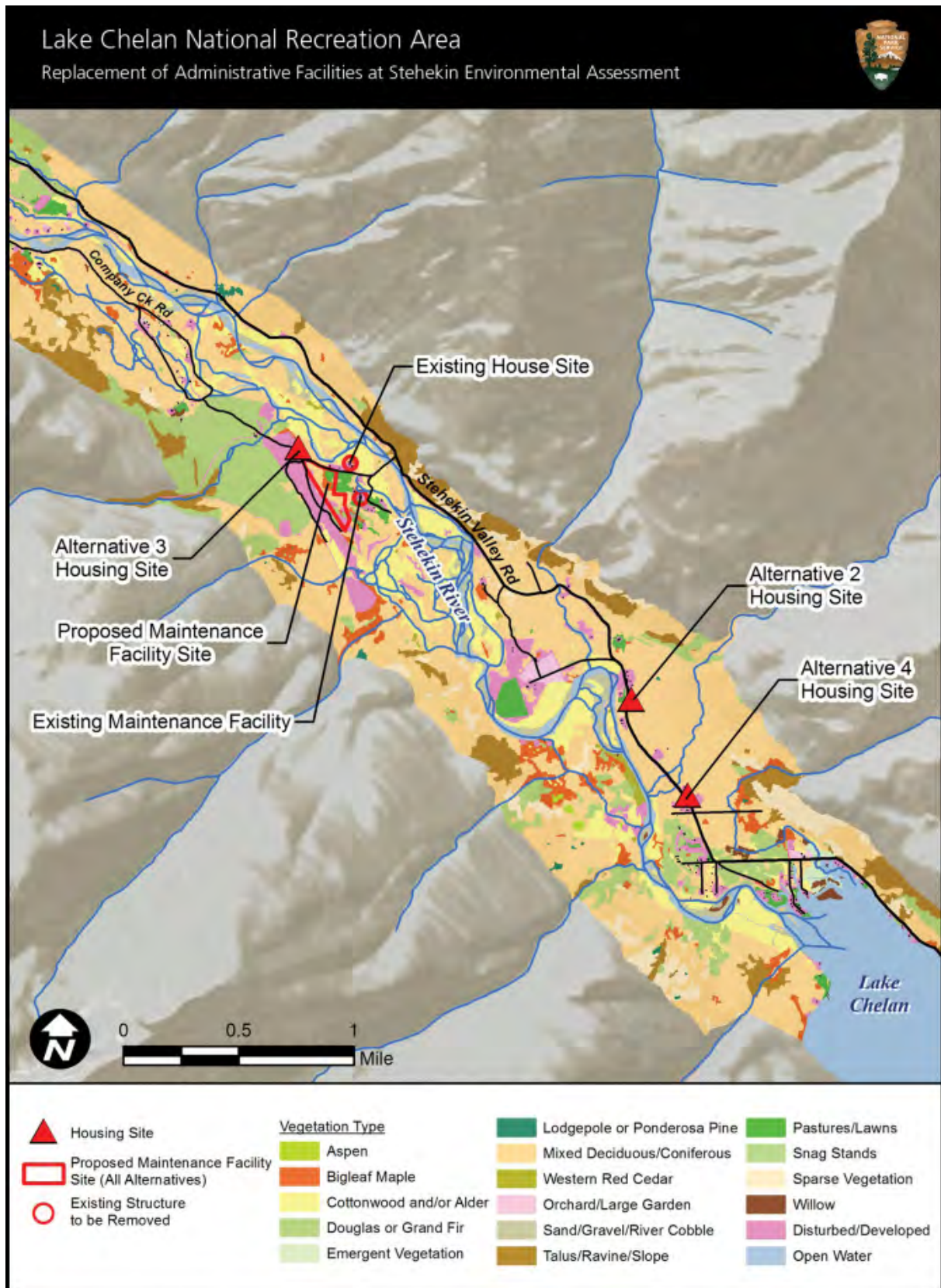
Plant community composition at the existing maintenance facility and existing residence to be removed are highly disturbed. Generally, no native vegetation remains in the footprints of these facilities. A combination of mixed conifer, mixed coniferous/deciduous, and wetland plant communities dominated by a variety of non-native species and native species exist around the fringes of these facilities.

#### Non-Native Species

Non-native plant species found throughout the Stehekin Valley are identified in the SRCIP / Final EIS. Non-native species are relatively uncommon on the alternative housing sites and the interior of the maintenance facility site. However, they are abundant in and around the existing maintenance facility and around the edges of the maintenance facility site adjacent to the airstrip. Species observed in this area include Himalayan blackberry (*Rubus armeniacus*), Japanese knotweed (*Polygonum cuspidatum*), reed canarygrass (*Phalaris arundinacea*), mullein (*Verbascum thapsus*), cheatgrass (*Bromus tectorum*), rush skeletonweed (*Chondrilla juncea*), Scotch broom (*Cytisus scoparius*), and hops. Recent NPS removal activities in this area have focused on knotweed and hops (NPS 2014a).



**Figure 16: Vegetation Types in Lower Stehekin Valley**





**Wetlands**

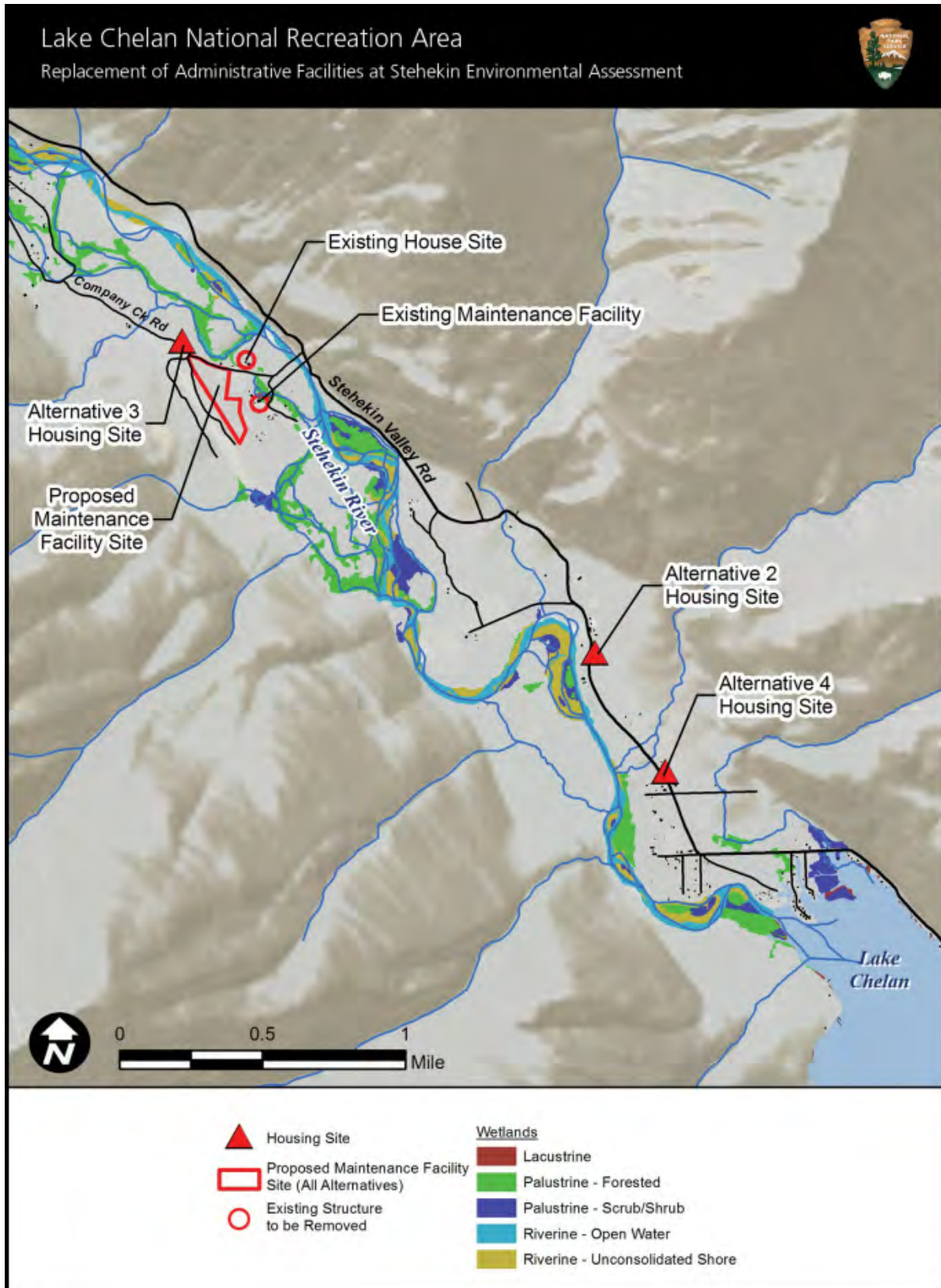
Wetlands perform key ecological functions at both the local and regional scales, including improving water quality through removal of sediment, excess nutrients (e.g., phosphorus and nitrogen), and heavy metals; maintaining watershed functions by moderating peak and base flows and recharging groundwater; and providing food and habitat for fish and wildlife (Sheldon et al. 2005; Mitsch and Gosselink 2000; NPS 2012a).

According to the Corps, wetlands are identified by hydrophytic soil types, hydrophytic vegetation, and hydrology (wet soil characteristics, wetland-dependent vegetation, and the presence of water) (Corps 2010). Wetlands within Lake Chelan NRA were classified according to the system developed by the USFWS (Cowardin et al. 1979). These wetlands are first characterized by what kind of water they are associated with and then by the type of vegetation or substrate. Recreation area wetlands fall into one of three categories: palustrine (wet vegetated areas), riverine (river or stream channels), or lacustrine (associated with a lake).

Palustrine wetlands are those freshwater areas not associated with lakes, but rather with persistent groundwater. Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and some saltwater wetlands. Palustrine wetlands include those areas called marshes, bogs, fens, and prairies, as well as shallow permanent or intermittent ponds. Palustrine wetlands are further classified as forested, emergent wetland persistent, and scrub-shrub wetlands (Cowardin et al. 1979). These areas may shift rapidly during flooding, depending on the erosive forces of the Stehekin River as the river changes course within its CMZ. Riverine wetlands include all wetlands and deepwater habitats contained within a channel, except for wetlands dominated by trees, shrubs, persistent emergent plants, emergent mosses, or lichens, and those near saltwater. Water is usually, but not always, flowing in the channel; these wetlands may also be surrounded on their floodplain by other kinds of palustrine wetlands (Cowardin et al. 1979). Similar to the palustrine wetlands, riverine wetlands change depending on the location of the Stehekin River and its associated side channels and tributaries.

No wetlands are present within the proposed footprints of any of the alternative maintenance facility layouts or housing sites. Large complexes of palustrine forested and scrub/shrub wetlands are present throughout the Stehekin River floodplains, occupying many of the side channels and tributaries. A palustrine forested wetland is located adjacent to the existing maintenance facility (Figure 17). This wetland is associated with a side channel of the Stehekin River that has been modified by a variety of human activities, including use as a mill pond and impacts from construction of Company Creek Road and the access road to the existing maintenance facility. Although this wetland is mapped as being within the boundaries of the existing maintenance facility, it is actually only adjacent to it.

Figure 17: Wetlands



### 3.2.3.2 Guiding Regulations and Policies

Key regulations and policies that guide the management of vegetation and wetlands in the project area are described in section 1.3. Some of the specific management objectives from the 1995 GMP pertinent to vegetation and wetlands include the following:

- *Preserve or restore ecological processes and conditions in wetland, floodplain, shoreline, and riparian areas.*
- *Manage Lake Chelan NRA as an integral part of a larger regional ecosystem, and protect and restore the components and processes of naturally evolving park ecosystems, including the natural abundance, biodiversity, and ecological integrity of plants, animals, water, and soil to the extent public safety considerations permit.*

Other overarching guiding regulations can be found in the Enabling Legislation for Lake Chelan NRA (Public Law 90-544; October 2, 1968), as well as the NPS Organic Act of 1916, NPS *Management Policies 2006*, and NPS Director's Orders. Brief summaries of applicable sections of the NPS *Management Policies 2006* are highlighted below.

- Section 4.4.1, General Principles for Managing Biological Resources, requires the NPS to preserve and restore native plant and animal populations and their habitats;
- Section 4.4.2.1, NPS Actions That Remove Native Plants and Animals, requires the NPS to ensure that their actions do not cause unacceptable impacts to natural park resources;
- Section 4.4.4, Management of Exotic Species, requires the NPS to not allow exotic species to displace native species if displacement can be prevented;
- Section 4.4.4.2, Removal of Exotic Species Already Present, requires the NPS to manage and eradicate exotic species;
- Section 4.4.5, Pest Management, requires that NPS comply with NPS pest management policies;
- Section 4.6.5, Wetlands, requires the NPS to avoid, minimize and restore wetlands in compliance with all applicable NPS and other federal mandates and policies. Guidance to implement wetland protection is included in Director's Order 77-1.

An overview of the Clean Water Act is provided in section 1.3.2.2. Lake Chelan, the Stehekin River and its tributaries, and adjacent wetlands are all waters of the U.S. and thus are regulated in part under Section 404 of the Clean Water Act. Proposals for flood protection and/or erosion control that may affect these waters must obtain a 404 permit and/or 401 water quality certification before proceeding. In Washington State, a Joint Aquatic Resources Permit Application (JARPA) initiates the Corps' review under Section 404 and Ecology's review for shoreline, floodplain, and 401 certification requirements. Both the Corps and Ecology can place conditions on permit applications as they relate to these programs. No fill or excavation in any waters of the U.S. is anticipated under any of the action alternatives. However, clearing and grading would require coverage under Section 401 of the Clean Water Act.

### 3.2.3.3 Impact Thresholds

This analysis focuses on current and reasonably foreseeable changes to plant community and wetland resources from the proposed actions. Impacts are assessed primarily at the project site level but also within the lower Stehekin Valley, when relevant. Two general types of impacts are discussed — beneficial and adverse. Beneficial impacts would improve the size, continuity, or diversity of native plants and wetlands within the project area. Adverse impacts would reduce the size, continuity, or diversity of native plants and wetlands.

Direct impacts to vegetation and wetlands for this project are based on a quantified area of habitat loss from the construction of the proposed facilities under each action alternative, as measured in Geographic Information System (GIS). Impacts were verified by field reconnaissance of all sites.

Indirect impacts, including potential to increase the spread of non-native plant species, are evaluated qualitatively based on field observations and professional judgment of NPS staff and consultants.

Impact intensity thresholds for vegetation and wetlands are defined as follows:

- **Negligible:** Impacts would have no measurable or perceptible changes in plant community size, continuity, or integrity. Individual native plants could be affected, but there would be no effect on native species populations. There would be no increases or barely detectable increases in the number of non-native species and the extent of their range. There would be no detectable changes to boundaries or functions of wetlands in the project area.
- **Minor:** Impacts would be measurable or perceptible and localized within a relatively small area, and the overall viability of plant populations and communities and wetlands would not be affected. Individual plants and/or a relatively minor segment of populations would be affected. Changes in the extent of non-native species would be localized and measurable. Mitigation may be needed to offset adverse effects, but would be straightforward to implement and would likely be successful.
- **Moderate:** The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population over a relatively large area. Changes in the extent of several or more non-native species would be over a relatively long period of time. Non-native plants could spread beyond the localized area. The change would be measurable and perceptible, but could be mitigated. Mitigation would be required for impacts to wetland area and function.
- **Major:** Impacts would be substantial, highly noticeable, and permanent in their effect on plant community and wetland size, diversity, continuity, or integrity. The alternative would have a considerable effect on native plant populations, non-native plants, and wetlands requiring extensive mitigation to offset adverse effects; success of the mitigation measures would not be certain.

#### **3.2.3.4 Alternative 1 (No Action)**

##### ***Analysis***

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would continue. The existing maintenance facility would continue to be used. Operation of this facility has negligible adverse impacts to wetlands and vegetation, limited to ongoing vegetation maintenance and indirect disturbance of the wetland adjacent to the existing maintenance facility (e.g., dust from vehicles, runoff from the access road). Changes to the solid waste processing fee structure would have no impacts to wetlands or native vegetation.

Indirect impacts of the No Action Alternative could include impacts to wetland water quality and habitat from future flood events as well as ongoing competition with non-native species on the existing maintenance site. Future flood events, if significant enough to inundate the existing maintenance facility, could wash various pollutants (e.g., sediment, fuel, oil, trash, etc.) into adjacent wetlands, reducing water quality and harming native fish and wildlife habitat. However, flood events large enough to produce this level of water in the maintenance facility would also be expected to dilute any contaminants sufficiently that the water quality and habitat effects to wetlands would be negligible.

##### ***Cumulative Impacts***

As described in the Final EIS for the SRCIP (NPS 2012a), a variety of past and ongoing development projects (including park facilities, trails, roads, and private residences) have resulted in modification of native vegetation on approximately 11% (283 acres) of the valley floor between Lake Chelan and High Bridge (see list of projects in section 3.1.3). In addition, approximately 1,426 acres within the Stehekin Valley have had some level of prescribed burn treatment to reduce ground fuels (NPS 2012a). In total, these past and ongoing activities have had minor to moderate adverse cumulative impacts to vegetation, particularly in riparian areas within the CMZ of the Stehekin River.

Implementation of NPS flood protection measures and relocation of the NPS hazardous materials trailer would not affect plants or wetlands. Construction of the remaining improvements on Stehekin Valley Road would remove additional native vegetation but potentially have beneficial effects to wetlands by moving the road out of the active CMZ of the Stehekin River.

Alternative 1 would have negligible cumulative impacts to vegetation.

Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would result in a range of minor to moderate adverse cumulative impacts to vegetation and wetlands in Lake Chelan NRA.

### **Conclusion**

Alternative 1 would have negligible adverse impacts to vegetation and wetlands. Ongoing use of the maintenance facility would involve no new clearing of vegetation. Ongoing NPS management of noxious and non-native plants would continue. Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would result in a range of minor to moderate adverse cumulative impacts to vegetation and wetlands in Lake Chelan NRA.

### **3.2.3.5 Alternative 2 (Preferred)**

#### **Analysis**

Construction of Alternative 2 would have minor adverse impacts to vegetation through the removal of approximately 2.6 acres of upland mixed conifer forest, including approximately 200 individual trees (including 38 trees greater than 21 inches dbh), which is the least impact of any of the action alternatives. This total impact includes 2.4 acres of vegetation at the proposed maintenance facility site and 0.2 acre at the housing site, and is about one tenth of one percent of the approximately 2,000 acres of upland mixed conifer forest mapped in the Stehekin Valley (Figure 16). The separate location of the fire facilities under Alternative 2, including the helipad and the spike camp (Figure 18), takes advantage of an existing clearing to minimize impacts to existing forest.

Additional short-term localized adverse impacts to vegetation are possible from use of adjacent areas for temporary equipment storage and staging. However, ample areas are available that are previously disturbed and/or free of vegetation (such as the ballfield or log yard), so these impacts are anticipated to be negligible.

No wetlands occur within the area potentially affected by Alternative 2. Therefore, no impacts to wetlands would occur.

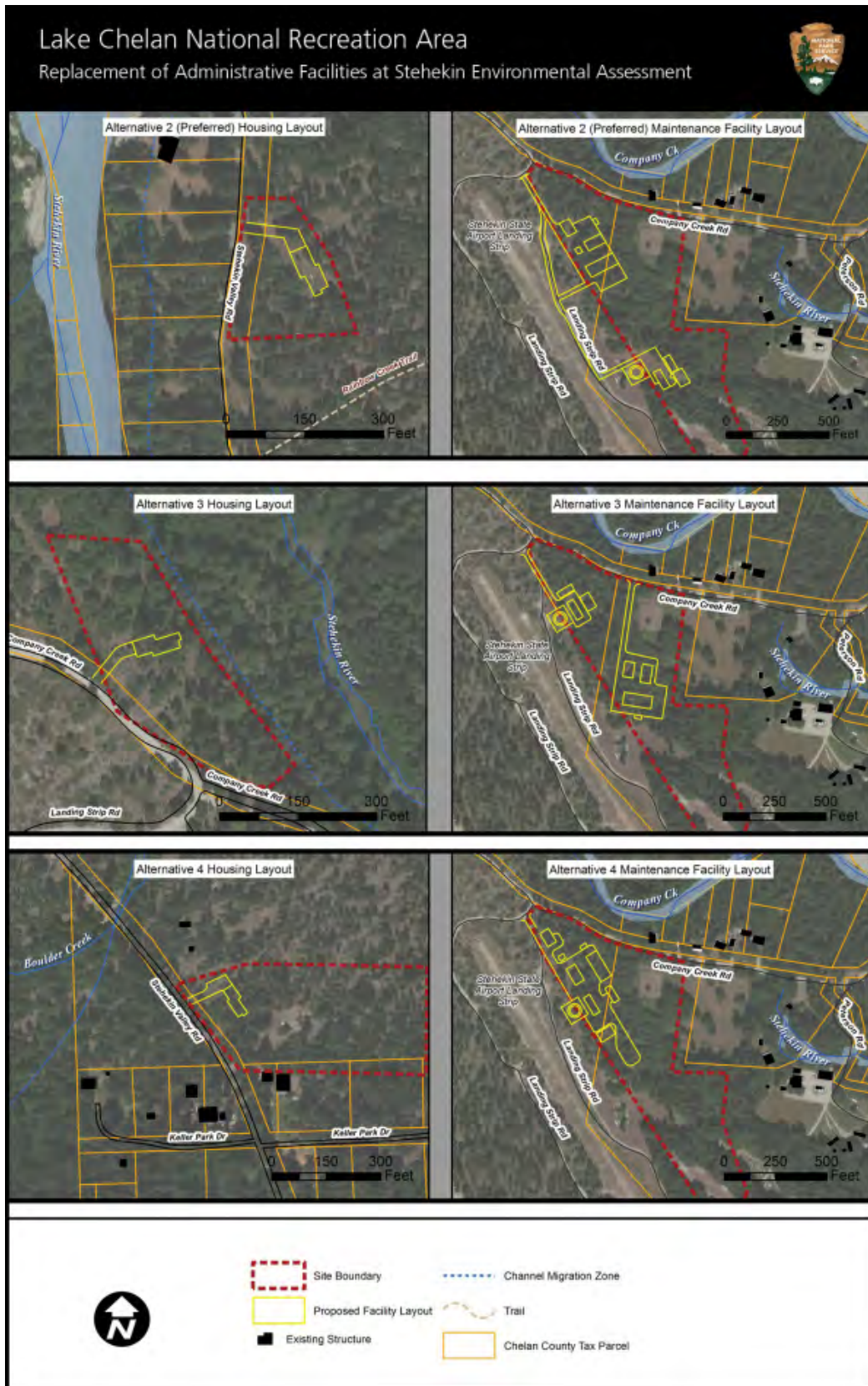
Minor localized short-term impacts to vegetation would occur from demolition of the existing facility. Previously disturbed vegetation adjacent to these structures could be damaged during the demolition process, and potentially from storage of material and equipment. These impacts would be limited to areas dominated by grass and non-native plant species.

Long-term benefits to wetlands and vegetation would result from restoration of the grounds of the existing maintenance facility and staff housing, which total approximately two acres. This restoration would include some combination of soil amendment, non-native plant removal, and planting of native shrubs and trees, particularly in the riparian buffer of the adjacent wetland. This restoration would improve the water quality and habitat functions of the wetland buffer, and partially offset the long-term loss of forested vegetation from the construction of the new facilities, although there would still be a temporal loss of vegetative structure until the planted trees were as large as the removed forest.

Alternative 2 is anticipated to have a minor long-term indirect adverse impact on vegetation through the introduction of new sources of non-native plant species, which are adapted to colonize recently disturbed sites. While Alternative 2 would disturb new ground and introduce new sources of non-native plants, NPS would include the new facilities in their routine weed control process, which is anticipated to minimize the spread of any major new infestations, making this adverse impact negligible.



**Figure 18: Aerial View of Vegetation on Action Alternative Sites**





**Cumulative Impacts**

The impacts to vegetation and wetlands from other actions in the valley are the same as those described for Alternative 1.

Alternative 2 would have localized minor adverse cumulative impacts to vegetation by permanently removing approximately 2.6 acres of mixed conifer forest, which would increase the modification of native vegetation in the Stehekin Valley to approximately 286 acres, which would still represent approximately 11 percent of the valley floor. This adverse impact would be further offset by the long-term beneficial impact of restoring approximately two acres of previously disturbed ground at the existing maintenance facility. Clearing of new ground under Alternative 2 would have a minor long-term adverse cumulative impact on the spread of non-native plant species in the project area.

Alternative 2 would contribute localized long-term beneficial cumulative effects to wetlands from the removal of the maintenance and housing facilities from the floodplain, and from the restoration of approximately two acres of riparian buffer in the footprint of the existing maintenance facility.

Overall, impacts from past actions, together with the impacts of implementing Alternative 2, would result in a range of minor to moderate adverse cumulative impacts to vegetation and wetlands in Lake Chelan NRA.

**Conclusion**

Alternative 2 would have minor localized adverse impacts to vegetation from the construction of a new facility, affecting approximately 2.6 acres of mixed conifer forest. Appropriate implementation of avoidance and minimization measures (section 2.5.3) would result in negligible adverse impacts from increased spread of non-native plant species and temporary storage areas. No adverse impacts to wetlands are anticipated from construction of Alternative 2. Demolition of the existing maintenance facility and restoration of approximately two acres of riparian habitat would have long-term benefits by increasing diversity and extent of riparian plant communities and restoring riparian wetland buffer habitat. Impacts from past actions, together with the impacts of implementing Alternative 2, would result in a range of minor to moderate adverse cumulative impacts to vegetation and wetlands in the Lake Chelan NRA.

**3.2.3.6 Alternative 3****Analysis**

Construction of Alternative 3 would have similar minor adverse vegetation impacts as Alternative 2. Alternative 3 would remove approximately 2.7 acres of upland mixed conifer vegetation, including approximately 250 individual trees (including 27 trees greater than 21 inches dbh). This total impact includes 2.5 acres of vegetation at the maintenance facility site and 0.2 acre at the housing site. This alternative still has the fire facilities separated, but they are located near the north end of the site. Under this alternative, a new road would be constructed off of Company Creek Road to access the new maintenance facility. The housing site for Alternative 3, located north of Company Creek Road, would have the most impacts to vegetation of the various housing sites, because it has the least existing clearings. Most of the affected vegetation on the housing site would be deciduous shrubs and a few trees.

Impacts related to temporary storage areas, spread of non-native plant species, wetlands, and restoration of the existing maintenance facility would be the same as Alternative 2 above.

**Cumulative Impacts**

Cumulative impacts for Alternative 3 are the same as Alternative 2.

**Conclusion**

The conclusion for Alternative 3 is the same as Alternative 2.

### 3.2.3.7 Alternative 4

#### **Analysis**

Construction of Alternative 4 would have the largest minor adverse impacts to vegetation, removing approximately 2.8 acres of upland mixed conifer vegetation, including approximately 265 individual trees (including 36 trees greater than 21 inches dbh). This total impact includes 2.6 acres of vegetation at the maintenance facility site and 0.2 acre at the housing site. While this alternative clusters the fire and maintenance facility functions, a large amount of permanent equipment storage and paved areas would create the largest vegetation impacts. Vegetation removed at the housing site would be primarily grass, forbs, and low-growing shrubs and a few trees.

Impacts related to temporary storage areas, spread of non-native plant species, wetlands, and restoration of the existing maintenance facility would be the same as Alternative 2 above.

#### **Cumulative Impacts**

Cumulative impacts for Alternative 4 are the same as Alternative 2.

#### **Conclusion**

The conclusion for Alternative 4 is the same as Alternative 2.

## 3.2.4 WILDLIFE

### 3.2.4.1 Affected Environment

Lake Chelan NRA is surrounded by more than 1.8 million acres of federally protected land, including the NOCA Service Complex, Glacier Peak Wilderness, Lake Chelan-Sawtooth Wilderness, and Stephen Mather Wilderness. Within this large area that is protected primarily for its natural features, a nearly intact assemblage of native wildlife species persist, including large carnivores, although some species have experienced serious population declines in the past 150 years.

Wildlife species inhabiting the Stehekin Valley include approximately 40 species of mammals, over 100 bird species, seven reptile species, and five species of amphibians. From summer 1988 through late winter 1992, as part of the Stehekin Valley vertebrate inventory, the following numbers of species were detected: 5 amphibians, 8 reptiles, 25 mammals, and 104 birds (Kuntz and Glesne 1993).

In general, habitat in the Stehekin Valley is comprised of a combination of upland mixed conifer forest and riparian forest adjacent to the Stehekin River and its side channels. Therefore, wildlife species found in the valley tend to be species associated with those habitats. Unique habitats important to wildlife in the valley include talus slopes, mudflats, wetlands, snag-rich areas, and streams.

The Final EIS for the SRCIP contained a detailed list of wildlife species using the Stehekin Valley (NPS 2012a). The most abundant mammal species that are commonly observed in the valley include mule deer (*Odocoileus hemionus*), marten (*Martes americana*), striped skunk (*Mephitis mephitis*), northern flying squirrel (*Glaucomys sabrinus*), and snowshoe hare (*Lepus americanus*); Trowbridge's, montane, and vagrant shrews (*Sorex trowbridgei*, *S. monticolus*, and *S. vagrans*); creeping vole (*Microtus oregoni*); Douglas's squirrel (*Tamiasciurus douglasii*); Townsend's chipmunk (*Eutamias townsendii*); yellow-pine chipmunk (*Eutamias amoenus*); and Cascades golden-mantled ground squirrel (*Spermophilus saturatus*), Yuma myotis (*Myotis yumanensis*), and little brown myotis (*Myotis lucifugus*).

The predominant bird species detected during the Stehekin Valley vertebrate inventory (Kuntz and Glesne 1993) were Hammond's flycatcher, Swainson's thrush, American robin, red-eyed vireo, yellow-rumped warbler, MacGillivray's warbler, western tanager, and dark-eyed junco. These species accounted for 50 percent of the detections and were present across all habitat classes sampled (Kuntz and Glesne 1993). During winter counts, 25 species were detected, with wintering waterfowl predominating (nine species comprising nearly half the detections), followed by pine siskin, evening grosbeak, chestnut-backed chickadee, red-breasted nuthatch, and golden-crowned kinglet. Wintering

waterfowl included horned grebe, Canada goose, mallard, American widgeon, ring-necked duck, common goldeneye, Barrow's goldeneye, bufflehead, and common merganser.

Common reptiles include the common garter snake (*Thamnophis sirtalis*), western terrestrial garter snake (*Thamnophis elegans*), western fence lizard (*Sceloporous occidentalis*), and the northern alligator lizard (*Gerhonotus coeruleus*). Amphibians include the northwestern salamander (*Ambystoma gracile*), rough-skinned newt (*Taricha ganulose*), Columbia spotted frog (*Rana luteiventris*), Cascades frog (*Rana cascadae*), and western toad (*Bufo boreas*).

Threats to wildlife and important habitat modifiers in the project area include wildfire, repeated large-scale flooding, high intensity visitor use in the summer, an increasing population of brown-headed cowbirds (Kuntz 2009 in NPS 2012a), and spread of non-native plant species.

#### 3.2.4.2 Guiding Regulations and Policies

Key regulations and policies that guide the management of wildlife in the project area are described in section 1.3. Some of the specific management objectives from the 1995 GMP pertinent to wildlife include the following:

- *Preserve and restore, when feasible, species and ecological relationships that would exist were it not for human impacts including control of nonnative species, and comply with federal, state and local laws and guidelines.*
- *Manage Lake Chelan NRA as an integral part of a larger regional ecosystem, and protect and restore components and processes of naturally evolving park ecosystems, including the natural abundance, biodiversity, and ecological integrity of plants, animals, water, and soil to the extent public safety considerations permit.*

Other overarching guiding regulations can be found in the Enabling Legislation for Lake Chelan NRA (Public Law 90-544; October 2, 1968), as well as the NPS Organic Act of 1916, NPS *Management Policies* (2006), and NPS Director's Orders. Some of the key sections of the NPS *Management Policies* that are applicable are highlighted below.

- *Management Policy 4.4.1.1 (Plant and Animal Population Management Principles) requires the NPS to adopt strategies that will maintain the natural population fluctuations of animal and plant populations in the park, as well as migratory populations that use the Park seasonally. MP 4.4.1.1 also requires the NPS to work with other land managers to encourage the conservation of the populations and habitats of plants and animals outside the parks whenever possible. As such, the NPS cooperates with other agencies whenever possible, including participating in local and regional planning efforts, suggesting mutually beneficial harvest regulations for lands outside the parks, conduct scientific research on plants and animals, and combat nonnative species.*
- *MP 4.4.2 (Management of Native Plants and Animals) requires NPS to maintain native plant and animal populations primarily through maintenance of natural processes. Active management is allowed when certain conditions are met; for instance, to maintain human safety, to protect human health, to protect rare species, or to protect specific cultural resources. The NPS will coordinate with other land management agencies as necessary to implement these actions. All management actions will be consistent with NPS policy and other federal law and regulations. The NPS will assess the results of managing plant and animal populations by conducting follow-up monitoring or other studies to determine the impacts of the management methods on nontargeted and targeted components of the ecosystem.*

The following state and federal laws also provide regulatory management for wildlife.

### Washington Department of Fish and Wildlife (RCW Title 77)

Washington State Department of Fish and Wildlife (WDFW) and the Washington Fish and Wildlife Commission are charged with the authority and responsibility of protecting and managing Washington State fish and wildlife resources under RCW Title 77.

### Fish and Wildlife Coordination Act (16 USC 661-667 (e))

The Fish and Wildlife Coordination Act provides the basic authority for WDFW's involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It also requires federal agencies that construct, license or permit water resource development projects to first consult with the WDFW (and the NMFS in some instances) regarding the impacts on fish and wildlife resources and measures to mitigate these impacts.

#### **3.2.4.3 Impact Thresholds**

This analysis focuses on current and reasonably foreseeable changes to wildlife resources from the proposed actions. Impacts are assessed primarily at the project site level but also within the lower Stehekin Valley, when relevant. Two general types of impacts are discussed – beneficial and adverse. Beneficial impacts would improve the size, continuity, or diversity of native wildlife populations and habitat within the project area. Adverse impacts would reduce the size, continuity, or diversity of native wildlife populations and habitat.

Direct impacts to wildlife are based on a combination of quantified area of habitat loss from the construction of the proposed facilities under each action alternative, as measured in GIS, along with a qualitative evaluation of likelihood of presence of certain species. Impacts were verified by field reconnaissance of all sites. Indirect impacts are evaluated qualitatively based on field observations and professional judgment of NPS staff and consultants.

Impact thresholds for wildlife are defined as follows:

- **Negligible:** The effects to wildlife would not be measurable. Adverse habitat impacts would be localized, and limited to previously disturbed habitat.
- **Minor:** Impacts would be measurable, but localized within a relatively small area. Wildlife occur in the project area, but their presence would be only on a transient or intermittent basis. Adverse construction impacts would be minimized by appropriate implementation of BMPs. No long-term effects to wildlife populations would occur.
- **Moderate:** Sufficient adverse impacts to habitat or individuals would occur to cause a change in abundance and distribution of wildlife populations; however, the impact would remain localized.
- **Major:** Impacts would be substantial, highly noticeable, and permanent in their effect on the population of a wildlife species. Adverse impacts could not be minimized and mitigated.

#### **3.2.4.4 Alternative 1 (No Action)**

##### ***Analysis***

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would continue. The existing maintenance facility would continue to be used. Operation of this facility has little or no direct impacts to habitat for wildlife species. Presumably, any individuals using the project area on a transient basis would be acclimated to the existing levels of human activity and would not change their daily or seasonal behaviors. Future flood events, if significant enough to inundate the existing maintenance facility, could wash various pollutants (e.g., sediment, fuel, oil, trash, etc.) into adjacent wetlands, reducing water quality and harming habitat potentially used by aquatic wildlife (particularly amphibians). Changes to the solid waste processing fee structure would have no direct impacts on wildlife. However, indirect impacts to wildlife are possible from future non-compliance with the

proposed solid waste processing fee. Specifically, if residents of the valley increase illegal dumping of garbage and other waste in lieu of paying the fee, then wildlife could experience indirect impacts, such as creation of an attracting food source that could lead to negative human interactions. Also, illegal dumping would create a potential source of toxic materials that could be ingested by wildlife. The extent and scope of these indirect effects of illegal dumping are unpredictable. Ongoing noxious weed control around the existing maintenance facility benefits native wildlife habitat. Alternative 1 would have negligible adverse impacts on wildlife that would not be measurable.

### **Cumulative Impacts**

As described in section 3.2.3, a variety of past and ongoing development projects (including park facilities, trails, roads, and private residences) have resulted in modification of native vegetation on approximately 11 percent (283 acres) of the valley floor between Lake Chelan and High Bridge (see list of projects in section 3.1.3). In addition, approximately 1,426 acres within the Stehekin Valley have had some level of prescribed burn treatment to reduce ground fuels (NPS 2012a). One of the effects of these projects that are important for wildlife is the change in snag densities. The Firewood Management Plan (NPS 1987) identified over 50 wildlife species dependent on snags,



Snag located on maintenance facility site.

while another study has documented 178 vertebrate species which use downed trees (Forest Service 1979). Currently, at least five of the valley's sensitive species could use snags and/or down logs as important habitat — pileated woodpecker, Vaux's swift, spotted owl, Pacific fisher, and western gray squirrel. In the lower Stehekin Valley, snags (dead standing trees) and downed trees have been heavily used in the past as a source of firewood. In 1987 it was estimated that at least 1,000 snags had been cut since 1968 (NPS 1987). The impacts of this practice have been debated. Oliver and Larsen (1981) observed cut stumps virtually throughout the lower valley and believed that the supply of snags was decreasing. Similarly, Tanimoto (1991) concluded that past firewood collecting has affected 1,400 acres of the lower valley, mostly in close proximity to roads. On these acres, snag densities are less than what would be found under natural conditions. These effects may have been balanced to some degree by the continued production of snags in the valley by wildfires since 1995. For example, the Company Creek Forest Fuel Reduction Area (FFRA) documented 100 snags within 200 feet of Company Creek, approximately ¼ mile from the proposed maintenance facility building site. Also, the Boulder Creek FFRA produced snags in the vicinity of the Alternative 2 and 4 housing sites. In general, wildlife species that occur in the project area are fairly common and abundant, and their populations are robust. Past and ongoing activities have resulted in minor adverse impacts to wildlife in the Stehekin Valley.

Implementation of NPS flood protection measures and relocation of the NPS hazardous materials trailer would not affect wildlife. Construction of the remaining improvements along the Stehekin Valley Road would remove additional wildlife habitat but this should have negligible effects on local wildlife populations.

Alternative 1 would contribute negligible impacts to wildlife.

Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would result in minor adverse cumulative impacts to wildlife resources in Lake Chelan NRA.

### **Conclusion**

Alternative 1 would have negligible adverse impacts to wildlife. Ongoing use of the maintenance facility would involve no new impacts to wildlife habitat. Wildlife species in the project area are acclimated to the existing levels of human activity. Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would result in minor adverse cumulative impacts to wildlife in Lake Chelan NRA.

#### **3.2.4.5 Alternative 2 (Preferred)**

##### ***Analysis***

Construction of Alternative 2 would have minor adverse impacts to wildlife through removal of approximately 2.6 acres of upland mixed conifer forest, including approximately 200 individual trees (including 38 trees greater than 21 inches dbh). This total impact includes 2.4 acres of vegetation at the maintenance facility site and 0.2 acre at the housing site. At the maintenance facility, this forest is a mid-seral habitat (not mature forest) with high canopy closure and relatively sparse understory. In general, this habitat removal would have long-term localized minor adverse effects on foraging, resting, and breeding habitat for a wide range of common wildlife species that may use this area, including songbirds, tree squirrels, ground squirrels, woodpeckers, raptors, and deer.

The separate location of the fire facilities under Alternative 2, including the helipad and the spike camp (Figure 5), takes advantage of an existing clearing to minimize impacts to habitat potentially used by wildlife on a transient basis. This alternative would have the least impact of any of the action alternatives on wildlife habitat. Minor short-term disturbance to wildlife using adjacent habitats would occur during demolition and construction, which is expected to extend over two construction seasons. Noise and activity from construction may discourage wildlife from using adjacent habitats for foraging and breeding. Wildlife in the immediate vicinity could have their daily activities interrupted by noise, dust, light and human activity during demolition activities. Most notable of these effects would be disturbance to wildlife using the adjacent wetland, such as waterfowl and cavity-nesting wildlife. This effect is anticipated to be minor because of the large numbers of existing sources of disturbance, including the airstrip, traffic on Company Creek Road, activity at the existing maintenance facility, residences on the east side of Company Creek Road, and seasonal use of the Harlequin Campground.

Long-term benefits to wildlife that utilize wetlands and riparian habitat would result from restoration of the grounds of the existing maintenance facility and staff housing, which total approximately two acres. This restoration would include some combination of soil amendment, non-native plant removal, and planting of native shrubs and trees, particularly in the riparian buffer of the adjacent wetland. This restoration would improve habitat quality for species like amphibians and cavity-nesting birds and bats. However, there would still be a temporal loss of habitat structure until the planted area gained the same size and age as the removed habitat.

Operation of Alternative 2 would have minor adverse impacts on wildlife using habitats adjacent to the new facilities. Wildlife may be disturbed by vehicle and foot traffic to and from the new facilities. Some wildlife could become victims of roadkill by the increase in vehicles travelling along Company Creek Road. However, wildlife are anticipated to become accustomed to human activity in the new areas within a relatively short time following construction. Indirect impacts on wildlife associated with potential non-compliance with the solid waste processing fee are the same as under Alternative 1.

##### ***Cumulative Impacts***

As described under Alternative 1 above, a variety of past and ongoing development projects (including park facilities, trails, roads, and private residences) have resulted in minor adverse effects to native wildlife habitat on approximately 11% of the Stehekin Valley. Substantially more area of wildlife habitat has been modified by wildfire. Implementation of NPS flood protection measures and relocation of the NPS hazardous materials trailer would not affect wildlife. Construction of the remaining improvements along the Stehekin Valley Road would remove additional native vegetation but potentially have beneficial effects to wetlands by moving the road out of the active CMZ of the Stehekin River.

Alternative 2 would have localized minor adverse impacts to wildlife by permanently removing approximately 2.6 acres of mid-seral forest habitat, which would increase the modification of native habitat in the Stehekin Valley to approximately 286 acres, which would still represent approximately 11% of the valley floor. In general, wildlife species that occur in the project area are fairly common and abundant, and their populations are robust. Therefore, these impacts are not expected to be detected at the population scale of any particular species. This adverse impact would be further offset



by the long-term beneficial effect of restoring approximately two acres of previously disturbed riparian habitat in the footprint of the existing maintenance facility.

Overall, impacts from past actions, together with the impacts of implementing Alternative 2, would result in minor adverse cumulative impacts to wildlife resources in Lake Chelan NRA.

### **Conclusion**

Alternative 2 would have minor localized adverse impacts to wildlife habitat from the construction of a new facility, affecting approximately 2.6 acres of mid seral forest, which would affect foraging, resting, and breeding habitat for a wide range of common wildlife species that may use the project area. Wildlife using the immediate vicinity of the project area could experience disturbance and changes to daily behavior and home ranges during active construction. This effect is expected to be minor, since wildlife in the area are already acclimated to daily human activity. Demolition of the existing maintenance facility and restoration of approximately two acres of riparian habitat would have long-term benefits by increasing diversity and extent of riparian wildlife habitat, benefiting amphibians and cavity-nesting birds. Impacts from past actions, together with the impacts of implementing Alternative 2, would result in minor adverse cumulative impacts to wildlife in Lake Chelan NRA.

#### **3.2.4.6 Alternative 3**

Alternative 3 would have similar minor adverse impacts to wildlife resources from habitat removal and disturbance as Alternative 2. Similarly, Alternative 3 would have similar beneficial effects as Alternative 2. As described in section 3.2.3, Alternative 3 would remove slightly more habitat than Alternative 2 (2.7 acres compared to 2.5 acres). However, this difference will cause no measurable difference to wildlife individuals or populations. The cumulative impacts and conclusions for Alternative 3 are the same as Alternative 2.

#### **3.2.4.7 Alternative 4**

Alternative 4 would have similar minor adverse impacts to wildlife resources from habitat removal and disturbance as Alternative 2. Similarly, Alternative 4 would have similar beneficial effects as Alternative 2. As described in section 3.2.3, Alternative 4 would remove slightly more habitat than Alternative 2 (2.8 acres compared to 2.5 acres). However, this difference will cause no measurable difference to wildlife individuals or populations. The cumulative impacts and conclusions for Alternative 4 are the same as Alternative 2.

### **3.2.5 SPECIAL STATUS SPECIES**

#### **3.2.5.1 Affected Environment**

##### ***Special Status Plants***

Table 6 below identifies all rare plants listed by the WDNR as potentially occurring in Chelan County (WDNR 2014a). Specific surveys targeting rare plants were not conducted as part of this EA. However, each area potentially affected by the proposed alternatives in the SRCIP / Final EIS, including the Peterson exchange parcel adjacent to the maintenance facility site, was surveyed for sensitive plants. None were found. Sensitive plant species with some potential to occur in the lower Stehekin Valley are denoted in Table 6. None of these species have been identified by NPS staff during site visits to the maintenance facility site or housing sites, nor are any of these species documented to occur in the project area by the WNHP GIS database (WDNR 2013).

**TABLE 6: RARE PLANTS IDENTIFIED BY WNHP AS OCCURRING IN CHELAN COUNTY**

Scientific Name	Common Name	State Status	Federal Status	Potential to Occur in Lower Stehekin Valley
<a href="#"><i>Agoseris elata</i></a>	tall agoseris	S		
<a href="#"><i>Anemone patens</i> var. <i>multifida</i></a>	pasqueflower	T		
<a href="#"><i>Anthoxanthum hirtum</i></a>	common northern sweet grass	R1		
<a href="#"><i>Astragalus arrectus</i></a>	Palouse milk-vetch	T		Yes
<a href="#"><i>Astragalus sinuatus</i></a>	Whited's milk-vetch	E	SC	
<i>Botrychium hesperium</i>	Western moonwort	T		
<a href="#"><i>Botrychium paradoxum</i></a>	two-spiked moonwort	T	SC	
<i>Buxbaumia viridis</i>	Busbaumia moss	R1		
<a href="#"><i>Carex comosa</i></a>	bristly sedge	S		
<a href="#"><i>Carex magellanica</i> ssp. <i>irrigua</i></a>	poor sedge	S		
<a href="#"><i>Carex praeceptorum</i></a>	Teacher's sedge	R1		
<a href="#"><i>Carex proposita</i></a>	Smoky Mountain sedge	T		
<a href="#"><i>Chaenactis thompsonii</i></a>	Thompson's chaenactis	S		
<a href="#"><i>Cicuta bulbifera</i></a>	bulb-bearing water-hemlock	S		Yes
<i>Cryptantha simulans</i>	Pine woods cryptantha	R1		
<a href="#"><i>Cryptantha spiculifera</i></a>	Snake River cryptantha	S		
<a href="#"><i>Cryptogramma stelleri</i></a>	Steller's rockbrake	S		
<a href="#"><i>Delphinium viridescens</i></a>	Wenatchee larkspur	T	SC	
<a href="#"><i>Erigeron salishii</i></a>	Salish fleabane	S		
<a href="#"><i>Eritrichium nanum</i> var. <i>elongatum</i></a>	pale alpine-forget-me-not	S		
<i>Erythranthe suksdorfii</i>	Suksdorf's monkeyflower	S		
<a href="#"><i>Geum rossii</i> var. <i>depressum</i></a>	Ross' avens	E		
<a href="#"><i>Githopsis specularioides</i></a>	common blue-cup	S		Yes
<a href="#"><i>Hackelia cinerea</i></a>	gray stickseed	S		
<a href="#"><i>Hackelia hispida</i> var. <i>disjuncta</i></a>	sagebrush stickseed	S		
<i>Hackelia taylori</i>	Taylor's stickseed	T		
<a href="#"><i>Hackelia venusta</i></a>	showy stickseed	E	LE	
<a href="#"><i>Iliamna longisepala</i></a>	longsepal globemallow	S		
<i>Kalmia procumbens</i>	Alpine azalea	T		
<a href="#"><i>Lycopodium lagopus</i></a>	One-cone ground-pine	R1		
<a href="#"><i>Nicotiana attenuata</i></a>	coyote tobacco	S		
<a href="#"><i>Ophioglossum pusillum</i></a>	Adder's-tongue	T		
<i>Oxytropis campestris</i> var. <i>cusickii</i>	Cusick's crazyweed	R1		
<i>Packera bolanderi</i> var. <i>whitedii</i>	Harford's ragwort	S		
<a href="#"><i>Pellaea brachyptera</i></a>	Sierra cliff-brake	S		Yes
<a href="#"><i>Pellaea breweri</i></a>	Brewer's cliff-brake	S		
<a href="#"><i>Penstemon eriantherus</i> var. <i>whitedii</i></a>	Fuzzytongue penstemon	S		Yes
<a href="#"><i>Petrophyton cinerascens</i></a>	Chelan rockmat	E	SC	
<i>Potentilla glaucophylla</i> var. <i>perdissecta</i>	Diverse-leaved cinquefoil	S		
<a href="#"><i>Rotala ramosior</i></a>	lowland toothcup	T		
<i>Salix pseudomonticola</i>	false mountain willow	S		
<a href="#"><i>Salix tweedyi</i></a>	Tweedy's willow	S		
<a href="#"><i>Salix vestita</i> var. <i>erecta</i></a>	rock willow	X		
<i>Saxifraga hyperborean</i>	pygmy saxifrage	S		

Scientific Name	Common Name	State Status	Federal Status	Potential to Occur in Lower Stehekin Valley
<a href="#"><i>Saxifragopsis fragarioides</i></a>	strawberry saxifrage	T		
<i>Schistostega pennata</i>	Luminous moss	R1		
<i>Scouleria marginata</i>	Marginate splashzone moss	T		
<a href="#"><i>Sidalcea oregana var. calva</i></a>	Wenatchee Mountain checker-mallow	E	LE	
<a href="#"><i>Silene sargentii</i></a>	Sargent's catchfly	R1		
<i>Silene scouleri ssp. scouleri</i>	Scouler's catchfly	S		
<a href="#"><i>Silene seelyi</i></a>	Seely's silene	S	SC	
<a href="#"><i>Spiranthes diluvialis</i></a>	Ute ladies' tresses	E	LT	
<a href="#"><i>Spiranthes porrifolia</i></a>	western ladies-tresses	S		Yes
<a href="#"><i>Subularia aquatica var. americana</i></a>	water awlwort	R1		
<a href="#"><i>Swertia perennis</i></a>	swertia	S		
<a href="#"><i>Trifolium thompsonii</i></a>	Thompson's clover	T	SC	

**Description of Codes**

Historic Record: H indicates most recent sighting in the county is before 1977.

**State Status:**

- E = Endangered. In danger of becoming extinct or extirpated from Washington.
- T = Threatened. Likely to become Endangered in Washington.
- S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
- X = Possibly extinct or Extirpated from Washington.
- R1 = Review group 1. Of potential concern but needs more field work to assign another rank.
- R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

**Federal Status:**

- LE = Listed Endangered. In danger of extinction.
- LT = Listed Threatened. Likely to become endangered.
- PE = Proposed Endangered.
- PT = Proposed Threatened.
- C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
- SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

**Special Status Fish and Wildlife**

Table 7 provides a comprehensive list of the special status fish and wildlife species with potential to occur in the lower Stehekin River Valley. All of these species are discussed in detail in the SRCIP / Final EIS. Only those species deemed likely to occur within the project area are discussed in detail in the text that follows the table.

Many of the species in Table 7 are not documented to occur in the Stehekin Valley. Suitable habitat for the species does not occur in the project area, or would not be expected to occur due to the high level of human activity in the valley. All of the proposed housing sites are located immediately adjacent to either the Stehekin Valley Road or Company Creek Road. The proposed maintenance facility site is located between the existing maintenance facility, the Stehekin Airstrip, and residences along Company Creek Road (Figure 18). Human activities associated with these facilities include daily motor vehicle traffic, intermittent airplane and helicopter take-offs and landings (estimated by WSDOT at 250 mostly focused between June and October), firewood cutting, garbage consolidation, and use of both large diesel engines and small equipment motors. The largest source of intermittent disturbance in this area is the use of the maintenance facility and airport during wildfires, when large amounts of people and material are brought to and from this area and staged in the immediate vicinity. Due to these multiple sources of both intermittent and regular noise, most special status species are anticipated to avoid the project area for either daily or seasonal behaviors.

**TABLE 7: SPECIAL STATUS FISH AND WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN THE STEHEKIN RIVER VALLEY (ADAPTED FROM NPS 2012A)**

Scientific Name	Common Name	State Status*	Federal Status*	Occurrence
<b>Mammals</b>				
<i>Canis lupus</i>	Gray wolf	SE	FE	Nearest known pack is the Lookout Pack, which occupies upper elevation areas of the Sawtooth Ridge area between Lake Chelan and Twisp. WDFW estimated this pack to consist of one breeding pair of adults and three pups at the end of 2013 (WDFW 2013). The last sightings of gray wolves in the Stehekin Valley below High Bridge were more than ten years ago (NPS 2012a). Individual transient wolves could cross the Stehekin Valley during long distance movements.
<i>Lynx canadensis</i>	Canada lynx	ST	FT	Canada lynx are closely associated with subalpine and boreal forests above 4,000 feet elevation. Designated critical habitat includes these areas east of the Stehekin River Valley. Although lynx's preferred prey item, snowshoe hare, is documented in the Stehekin Valley, lynx have not been reported from the valley since 1980 (NPS 2012a).
<i>Ursus arctos horribilis</i>	Grizzly bear	SE	FT	The proposed project is within the North Cascades Ecosystem Grizzly Recovery Zone (NPS 2012a). Systematic hair and camera surveys in 2010 and 2011 detected no grizzlies in the North Cascades. The last observation was a photograph of a lone bear in the Upper Cascade River drainage west of the Stehekin Valley in September 2010 (USFWS 2011). No grizzlies are expected to occur in the Stehekin Valley.
<i>Gulo gulo luteus</i>	California wolverine	SC	FC	Stehekin Valley was part of active home range of three different individual wolverines between 2006 and 2009. Wolverines have also been identified at Ice Lake, about 12 miles south of the airstrip, in summer of 2013.
<i>Martes pennanti pacifica</i>	Pacific fisher	SE	FC	Fishers are not considered to have a viable wild reproducing population in Washington currently, with the exception of a reintroduced population on the Olympic Peninsula. Fishers have not been documented in the Stehekin Valley since 1980, and were not detected during forest carnivore surveys (NPS 2012a).
<i>Sciurus griseus</i>	Western gray squirrel	ST	FSC	Documented to occur in project area. <u>See detailed discussion below.</u>
<i>Corynorhinus townsendii townsendii</i>	Pacific Townsend's big-eared bat	SC	FSC	Not documented in the Stehekin Valley (NPS 2012a). This bat is widespread in Washington, but rare. Hibernacula are closely associated with buildings, mines and caves, and are particularly sensitive to disturbance (Hayes and Wiles 2013).
<i>Myotis ciliolabrum</i>	Small-footed myotis	SM	FSC	WDFW documents this species from T33N, R18E, east of Stehekin. Would be most closely associated with cliffs, talus slopes, and rocky outcrops surrounding the valley.
<i>Myotis evotis</i>	Western long-eared myotis	SM	FSC	Documented in the Stehekin Valley (NPS 2012a).
<i>Myotis thysanodes</i>	Fringed myotis	SM	FSC	Not documented in Stehekin Valley, with patchy, but widespread distribution throughout eastern Washington. Common in dry ponderosa pine forests, particularly in proximity to rocky areas with talus (Hayes and Wiles 2013).
<i>Myotis volans</i>	Long-legged myotis	SM	FSC	Documented in the Stehekin Valley (NPS 2012a).
<i>Myotis keenii</i>	Keen's myotis	SC		Not expected to occur in eastern Washington (Hayes and Wiles 2013).
<b>Birds</b>				
<i>Haliaeetus leucocephalus</i>	Bald eagle	SS	FSC	A single pair has nested at the head of Lake Chelan since 2001. Up to five eagles have been observed in the fall and winter in the area (NPS 2012a). Eagles would be expected to forage and potentially roost in the vicinity of the maintenance facility on an intermittent basis.

Scientific Name	Common Name	State Status*	Federal Status*	Occurrence
<i>Strix occidentalis caurina</i>	Northern spotted owl	SE	FT	<a href="#">See detailed discussion below.</a>
<i>Falco peregrinus anatum</i>	Peregrine falcon	SS	FSC	Individual birds have been observed in the Stehekin Valley, but no nests have been identified (NPS 2012a).
<i>Aquila chrysaetos</i>	Golden eagle	SC		Golden eagles have been observed foraging along the lower Stehekin River in winter (NPS 2012a). However, no nests have been documented in the NOCA.
<i>Falco columbarius</i>	Merlin	SC		Merlin are closely associated with coastal areas and major rivers in eastern Washington. They occur in the north Cascades primarily during migration. Only three records of merlin exist from the Stehekin Valley (NPS 2012a).
<i>Accipiter gentilis</i>	Northern goshawk	SC	FSC	Northern goshawk have been documented using coniferous forests in the Stehekin Valley (NPS 2012a). They are generally closely associated with late seral and old growth conifer forests along the lakeshore and on the surrounding valley slopes. They could forage in the project area.
<i>Contopus cooperi</i>	Olive-sided flycatcher		FSC	Documented using deciduous riparian forests along the Stehekin River (NPS 2012a). Generally more common in western Washington.
<i>Histrionicus histrionicus</i>	Harlequin duck	SC		Harlequin ducks nest along mountain streams in the Cascades and Olympic Mountains and winter in marine waters. NPS surveys from the early 1990s documented between 7 to 11 pairs of ducks nesting along the Stehekin River, among the highest nesting density on any North American river. The wetland adjacent to the existing maintenance facility provides some potential nesting habitat in the form of snags.
<i>Cypseloides niger</i>	Black swift		FSC	Not documented in the Stehekin Valley, although potential suitable breeding habitat (rock cliffs adjacent to or behind waterfalls) is present in the valley.
<i>Melanerpes lewis</i>	Lewis' woodpecker	SC		Not recently documented from the Stehekin Valley (NPS 2012a). Closely associated with dry open pine forests.
<i>Picoides arcticus</i>	Black-backed woodpecker	SC		Closely associated with recently burned areas with snags. Three records from the lower Stehekin Valley (NPS 2012a). Recent fires in and around the valley may have improved habitat for this species.
<i>Dryocopus pileatus</i>	Pileated woodpecker	SC		<a href="#">See detailed discussion below.</a>
<i>Gavia immer</i>	Common loon	SS		Uncommon in the NOCA. Only a single observation was made during landbird monitoring in the NOCA in 2012 (Holmgren et al. 2013).
<i>Aechmophorus occidentalis</i>	Western grebe	SC		Uncommon migrant to large lakes in the NOCA. Not documented from the Stehekin Valley.
Reptiles				
None				
Amphibians				
<i>Rana luteiventris</i>	Columbia spotted frog	SC		Documented to occur in the Stehekin Valley (NPS 2012a; WDFW PHS 2014) in the 1990s. Breeding habitat consists of flooded margins of wetlands, ponds, lakes, and creeks. Could occur in wetland adjacent to existing maintenance facility.
<i>Bufo boreas</i>	Western toad	SC	FSC	Documented to occur in the Stehekin Valley; locally common (NPS 2012a). Breeding habitat consists of lakes, springs, ponds, wetlands, and slow streams. Can make long upland movements between aquatic habitats. Declining dramatically in many parts of its range (WDNR 2014b).

Scientific Name	Common Name	State Status*	Federal Status*	Occurrence
<i>Rana cascadae</i>	Cascades frog		FSC	Cascades frogs were found in a variety of aquatic habitats in the lower Stehekin Valley in the early 1990s, including riparian habitats adjacent to the Stehekin River (NPS 2012a).
<i>Ascaphus truei</i>	Tailed frog		FSC	Tailed frogs are closely associated with high gradient mountain streams and adjacent riparian habitat. It is unlikely that they occur in the lower Stehekin Valley.
Fish				
<i>Salvelinus confluentus</i>	Bull Trout	SC	FT	Last confirmed report of bull trout in Lake Chelan was in 1957, and are now considered extirpated from the lower Stehekin River (NPS 2012a).
<i>Salvelinus malma</i>	Dolly varden		FP, FSC	Dolly varden are nearly indistinguishable from bull trout. They do not occur in the Stehekin River.
<i>Oncorhynchus tshawytscha</i>	Chinook salmon	SC	FT*	Chinook salmon that occur in the lower Stehekin River and its tributaries are a combination of stocked triploid fish that are unable to reproduce and a small naturally reproducing landlocked population that originated from sexually viable fish planted in Lake Chelan from 1974 to 2002 (Anthony and Glesne 2013). This population is not protected under ESA provisions as are most other anadromous Chinook Evolutionarily Significant Units in Washington.
<i>Oncorhynchus clarkia lewisii</i>	Westslope cutthroat trout		FSC	Westslope cutthroat trout have declined substantially since the early 1900s, due to a combination of competition from non-native rainbow trout and kokanee salmon, overfishing, and hybridization. Still, native fish are abundant in the upper Stehekin River and its major tributaries, such as Bridge and Park creeks (NPS 2012a). Recent surveys by the NPS in the lower Stehekin River and its side channels observed no cutthroat trout or redds during any spring surveys (Anthony and Glesne 2012). Eight cutthroat trout were observed holding in shallow water with kokanee salmon during summer surveys.
Invertebrates				
None				

\*Federal Status: FE = Federally Endangered; FT = Federally Threatened; FP = Federally Proposed; FC = Federal Candidate; FSC = Federal Species of Concern.  
State Status: SE = State Endangered; ST = State Threatened; SC = State Candidate; SS = State Sensitive; SM = State Monitored



### Western Gray Squirrel

Western gray squirrels in the Stehekin Valley are part of a geographically and genetically isolated population in the North Cascades that is ecologically unique in that it utilizes a mixed conifer forest habitat that lacks oak trees, which are the basis of forage and nesting habitat in most other extant populations in Washington and elsewhere. A number of studies have investigated the distribution and habitat use by western gray squirrels in the Stehekin Valley (Hamer et al. 2005; Stuart 2012). Hamer et al. (2005) identified western gray squirrel nests distributed in patches around the valley, including along the Lakeshore Trail, in the area surrounding the Stehekin Landing and Golden West Visitor's Center, the Boulder Creek area, the Buckner Orchard, and Rainbow Falls. This study also reported anecdotal information that squirrels have not been documented on the Company Creek side of the Stehekin River (Hamer et al. 2005). Hamer's study also concluded that squirrels in the valley prefer to nest in dominant trees that were typically the largest trees in a stand and had good interconnectivity with surrounding trees, which presumably allows for easier arboreal movement. Squirrels also showed a preference for conifers as nest trees in the valley. Specific nest locations from the Hamer study were not available, but their study areas included all of the proposed housing sites as well as the entire maintenance facility site. Stuart (2012) studied a wide range of ecological characteristics of the Stehekin gray squirrel populations. Some of the important conclusions from this study included:



Western Gray Squirrel.

- Western gray squirrels in Stehekin used fire-treated areas more than expected, despite the fact that prescribed burning eliminates or reduces some of the habitat features seemingly important to the squirrels, including presence of mistletoe brooms, tree density, etc.
- Movement distances of squirrels in Stehekin averaged 620 feet for females and 2,834 feet for males; however, movements of up to 5 miles (and more than 20 miles on one occasion) were not unusual, particularly for males.
- Home ranges for squirrels in Stehekin were smaller and had higher overlap than elsewhere in their range, indicating habitat quality may not be as poor in the North Cascades as previously thought.
- The study found that *Rhizopogon* and *Geopora* (truffles) were the most common fungal food species eaten by the squirrels. There was no evidence that recent moderate intensity wildlife and fire fuel reduction treatments have negatively affected the fungal composition of the squirrels' diet.

Based on squirrel locations mapped by Stuart (2012), western gray squirrels were observed on or near both the Alternative 2 and 4 housing sites. It is unclear whether or not that study included surveys at the maintenance facility site, but since habitat in that area is arguably better for western gray squirrels (larger trees, better canopy connection, etc.), then it can be assumed that site provides suitable habitat for them. However, surveys at the Company Creek FFRA (about ¼ mile from the maintenance facility site) did not document any western gray squirrels (NPS 2014b). Stuart (2012) also found relatively high mortality rates in the Stehekin population, which when combined with the high movement ability of the squirrels in this population, means that nest locations and presence of squirrels on a particular site can fluctuate significantly from year to year.

### Northern Spotted Owl

Northern spotted owls occupy structurally complex forested habitat in mature or old growth forests, where trees are of variable species, sizes, and ages, and snags and multi-storied canopies are present. They are found from British Columbia throughout the Pacific Northwest and into California. In 1993, park surveys located three nesting pairs and two additional single owls, all between the mouth of Bridge Creek and the southern boundary of Lake Chelan NRA. Since 1993, known pair sites in the Stehekin Valley and its tributaries up to the mouth of Bridge Creek have been surveyed three times each year. None of these sites are in close proximity to any of the action alternatives. The closest is referred to as the McGregor Meadows Activity Site. Located approximately 500 feet from the Stehekin Valley Road on the south side of the Stehekin Valley, the pair was discovered in July 1998 during a cavity-nesting bird survey. Later, this discovery was confirmed when an adult pair and three juveniles were observed. A history of activity at this site is included in Table 8 below. The maintenance facility site is approximately 1.5 miles southeast of McGregor Meadows.



Northern Spotted Owl

**TABLE 8: MCGREGOR MEADOWS NORTHERN SPOTTED OWL ACTIVITY SITE HISTORY**

Year	Occupancy	Reproduction	Notes
1998	Pair occupancy confirmed	Reproduction confirmed	2 young banded
1999	Pair occupancy confirmed	Reproduction unknown	
2000	Single occupancy confirmed (male). Pair occupancy unknown	Reproduction unknown	
2001	Occupancy unknown	Reproduction unknown	
2002	Occupancy unknown	Reproduction unknown	
2003	No surveys		
2004	Single occupancy confirmed (male). Pair occupancy unknown	Reproduction unknown	
2005	Pair occupancy confirmed		2 juveniles fledged
2006	Pair occupancy confirmed		1 juvenile observed
2007	Pair occupancy confirmed	Productivity failed (or non-nesting)	
2008	Site unoccupied. No spotted owls detected.	Reproduction unknown	Pair of barred owls found
2009	Site unoccupied. No spotted owls detected.	Reproduction unknown	Pair of barred owls found
2010	Site occupancy confirmed (male). Pair occupancy unknown	Reproduction unknown	
2011	Site occupancy confirmed	Reproduction unknown	Pair occupancy unknown
2012	Occupancy unknown		Site occupied by a pair of barred owls
2013	Pair occupancy confirmed	Reproduction unknown	
2014	Single occupancy confirmed (male). Pair occupancy confirmed	Reproduction confirmed	2 juveniles

The Stehekin River watershed is a Designated Conservation Area (DCA) for the northern spotted owl. The Recovery Plan for the species identifies most of the Stehekin Valley as a DCA. In 1995 it was estimated that approximately 2,500 acres of suitable habitat were available for owls in the Stehekin Valley (USFWS 1995). No designated critical habitat for the northern spotted owl is present in the Stehekin Valley.

### Pileated Woodpecker

Pileated woodpecker is the largest woodpecker native to Washington. In general, they are associated with mature and old-growth forests for breeding. However, they are common in any forest type that has sufficient large trees available for nesting and roosting. A primary cavity excavator, they build large rectangular nest cavities that are later used by a wide range of wildlife, including owls, swifts, flickers, squirrels, bats, and migratory songbirds. They have been observed throughout the Stehekin Valley (NPS 2012a) and would be expected to occur on any of the proposed building sites.



Pileated Woodpecker.

#### **3.2.5.2 Guiding Regulations and Policies**

Key regulations and policies that guide the management of special status species in the project area are described in section 1.3. Some of the specific management objectives from the 1995 GMP pertinent to special status species include the following:

- *Preserve and restore, when feasible, species and ecological relationships that would exist were it not for human impacts including control of nonnative species, and comply with federal, state, and local laws and guidelines.*

Other overarching guiding regulations can be found in the Enabling Legislation for Lake Chelan NRA (Public Law 90-544; October 2, 1968), as well as the NPS Organic Act of 1916, NPS *Management Policies* (2006), and NPS Director's Orders. Excerpts from several sections of the NPS *Management Policies* that are applicable are highlighted below.

- *Section 4.4.2.3, Management of Threatened or Endangered Plants and Animals, requires the NPS to survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act.*

NPS will determine all management actions for the protection and perpetuation of federally, state, or locally listed species through the park management planning process, and will include consultation with lead federal and state agencies as appropriate.

The following state and federal laws also provided regulatory management for special status species.

#### Endangered Species Act, as Amended

The criteria for determining threatened and endangered plant and animal species is provided by the ESA, which is administered by National Oceanic and Atmospheric Administration (NOAA) Fisheries and the USFWS. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine species such as salmon and whales. Section 7 of the ESA requires each federal agency to ensure its actions to authorize, permit, or fund a project do not jeopardize the continued existence of any threatened or endangered species. It describes consultation procedures and conservation obligations.

#### Washington Department of Fish and Wildlife (RCW Title 77)

WDFW and the Washington Fish and Wildlife Commission are charged with the authority and responsibility of protecting and managing Washington State fish and wildlife resources under Revised RCW Title 77

#### Washington Department of Natural Resources (RCW 79.70.030)

RCW 79.70.030 authorizes the Washington Department of Natural Resources (WDNR) to establish and maintain a natural heritage program that "shall maintain a classification of natural heritage resources," which, as defined in RCW 79.70.020, includes special plant species.

### Migratory Bird Treaty Act

The Migratory Bird Treaty Act, administered by the USFWS, makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of taking of game birds during established hunting seasons.

### Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act, administered by the USFWS, makes it unlawful to take, import, export, sell, purchase, or barter any bald or golden eagle, their parts, products, nests, or eggs.

#### **3.2.5.3 Impact Thresholds**

This analysis focuses on current and reasonably foreseeable changes to special status species from the proposed actions. Impacts are assessed primarily at the project site level but also within the lower Stehekin Valley, when relevant. Two general types of impacts are discussed – beneficial and adverse. Beneficial impacts would improve the size, continuity, or diversity of special status species populations and habitat within the project area. Adverse impacts would reduce the size, continuity, or diversity of special status species populations and habitat.

Direct impacts to special status species are based on a combination of quantified area of habitat loss from the construction of the proposed facilities under each action alternative, as measured in GIS, along with a qualitative evaluation of likelihood of presence of such species. Impacts were verified by field reconnaissance of all sites. Indirect impacts are evaluated qualitatively based on field observations and professional judgment of NPS staff and consultants.

Impact thresholds for special status species are defined as follows:

- **Negligible:** The effects to special status species would not be measurable. Habitat impacts would be short term and localized, and limited to habitat not used by special status species.
- **Minor:** Habitat impacts would be measurable, but localized within a relatively small area. Special status species may occur in the project area, but their presence would be only on a transient or intermittent basis. Short-term impacts would be minimized by appropriate implementation of BMPs.
- **Moderate:** Adverse impacts to individuals of a special status species would be probable; however, the impact would remain localized and short term. The change would be measurable and perceptible, but could still be minimized and mitigated, and would not reach the population level.
- **Major:** Impacts would be substantial, highly noticeable, and permanent in their effect on the population of a special status species. Impacts could not be minimized and mitigated.

#### **3.2.5.4 Alternative 1 (No Action)**

##### ***Analysis***

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would continue. The existing maintenance facility would continue to be used. Operation of this facility has no direct impacts to habitat for special status species. Presumably, any individuals of these species using the project area on a transient basis would be acclimated to the existing levels of human activity and would not change their daily or seasonal behaviors. Changes to the solid waste processing fee structure would have no direct impacts to special status species. Alternative 1 would have negligible impacts to special status species.

##### ***Cumulative Impacts***

A wide variety of past and present private and public activities have led to the current distribution of special status species in the Lake Chelan NRA and surrounding region, including infrastructure development, housing, wildfire management, hunting, habitat fragmentation, active wildlife management (e.g., reintroduction), and timber harvest. In the Lake Chelan NRA specifically, there are

less landscape-level anthropomorphic changes at play, but more natural resource management and site-specific development activities, including road and facility maintenance. Most of the native wildlife assemblage that was present in the Lake Chelan NRA prior to the arrival of the settlers is still present. In total, these past and ongoing activities have had minor adverse cumulative impacts to special status species that occur within the Lake Chelan NRA.

Alternative 1 would have negligible cumulative impacts to special status species. Implementation of NPS flood protection measures and relocation of the NPS hazardous materials trailer would not affect special status species. Construction of the remaining improvements along the Stehekin Valley Road would remove additional wildlife habitat, but this should have negligible effects on local special status species populations. All of these ongoing projects, if they are within the range or habitat of federally listed species, have undergone consultation with the USFWS, which has stipulated appropriate minimization and avoidance measures for those projects.

Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would continue to result in minor adverse cumulative impacts to special status species in the Lake Chelan NRA.

### **Conclusion**

Alternative 1 would have negligible impacts to special status species, which are likely acclimated to ongoing uses of the maintenance facility and surrounding area. Overall, impacts from past actions, together with the impacts of implementing Alternative 1, would continue to result in minor adverse cumulative impacts to special status species in the Lake Chelan NRA.

#### **3.2.5.5 Alternative 2 (Preferred)**

##### **Analysis**

Alternative 2 would remove approximately 2.6 acres of upland mixed conifer forest, including approximately 200 individual trees (including 38 trees greater than 21 inches dbh), which could provide suitable habitat for a small number of special status species with potential to occur in the project area.

The only federally listed species that is documented to occur in the Stehekin Valley and has habitat potentially affected by Alternative 2 is the northern spotted owl. The forest located at the maintenance facility site is not suitable breeding habitat due to its lack of old growth characteristics and high level of human activity, but could provide suitable foraging and dispersal habitat for spotted owls, particularly the pair that nests at McGregor Meadows. Spotted owls are known to use highly fragmented habitat for dispersal and foraging. Alternative 2 would remove less than one tenth of one percent of spotted owl suitable habitat available in the Stehekin Valley. Furthermore, the distance to the McGregor Meadows nest and existing high level of human activity would suggest that seasonal work restrictions are not necessary at this location, since the likelihood of owls using the site is very low.

Removal of approximately 2.6 acres of upland mixed conifer forest, along with 38 trees greater than 21 inches dbh, would have minor adverse impacts to western gray squirrel habitat. Western gray squirrel activity has been documented at the housing site for Alternative 2 (Stuart 2012). Although gray squirrel nests have not been recently documented in the project area (including no squirrels documented at the Company Creek FFRA), suitable habitat (high canopy closure forest, occupied elevation range, presence of Douglas fir dominant trees) is present. Based on available research, it appears that the amount of suitable habitat present in the Stehekin Valley far exceeds the extant squirrel population.

Alternative 2 would have minor adverse impacts to pileated woodpecker roosting and nesting habitat. These large cavity-nesting birds have not been observed nesting on the maintenance facility site, but suitable nest trees are present. However, pileated woodpeckers are common in the valley and not habitat-limited.

Beneficial impacts to special status species that utilize wetlands and riparian habitat would result from restoration of the grounds of the existing maintenance facility and staff housing, which total approximately two acres. This restoration would include some combination of soil amendment, non-native plant removal, and planting of native shrubs and trees, particularly in the riparian buffer of the adjacent wetland. This restoration would improve habitat quality for species like Cascades frog and harlequin duck.

Minor short-term disturbance to some special status wildlife species could occur from demolition of the existing facilities, if any individuals of those species documented to occur in the Stehekin Valley were present in the immediate vicinity during demolition. The most likely species to be present include some of the bats (including long-eared and long-legged myotis), amphibians (including western toad, Columbia spotted frog, and Cascades frog), as well as the olive-sided flycatcher and pileated woodpecker.

No special status plant species are documented within the project area for Alternative 2. Therefore, there would be no direct impacts to special status plant species.

### ***Cumulative Impacts***

As described under Alternative 1 above, a variety of past and ongoing development projects (including park facilities, trails, roads, and private residences) have resulted in modification of native wildlife habitat on approximately 11 percent of the Stehekin Valley. Substantially more area of wildlife habitat has been modified by wildfire.

Implementation of NPS flood protection measures and relocation of the NPS hazardous materials trailer would not affect special status species. Construction of the remaining improvements on Stehekin Valley Road would remove additional native wildlife habitat but potentially have beneficial effects to wetlands by moving the road out of the active CMZ of the Stehekin River, which could benefit some of the aquatic special status species (e.g., cavity-nesting ducks and amphibians). All of these ongoing projects, if they are within the range or habitat of federally listed species, have undergone consultation with the USFWS, which has stipulated appropriate minimization and avoidance measures for those projects.

Alternative 2 would have minor adverse cumulative impacts to special status species, which are generally not documented in the project area. However, permanent removal of approximately 2.6 acres of upland mixed conifer forest would further permanently reduce suitable habitat for certain special status species in the lower Stehekin Valley, specifically, pileated woodpecker, northern spotted owl, and western gray squirrel. This adverse impact would be somewhat offset by the long-term beneficial impact of restoring approximately two acres of previously disturbed ground at the existing maintenance facility. However, there will be a long-term temporal loss of mid seral forest, which will take time to develop in the restored area. Of these three species, cumulative impacts to western gray squirrel are of greatest concern, since this small isolated population in the Stehekin Valley is at high risk of extinction.

Overall, impacts from past actions, together with the impacts of implementing Alternative 2, would result in minor adverse cumulative impacts to special status species in the Lake Chelan NRA.

### ***Conclusion***

#### **Listed Species**

Of the four federally listed species that potentially occur in the Stehekin Valley (Table 7), three are highly mobile, widely ranging predators with dispersed populations – gray wolf, grizzly bear, and Canada lynx. None of these three species are known to use the Stehekin Valley as part of their home range, but they are known or can be assumed to move through the area on a transient basis during dispersal or long range foraging movements. In particular, gray wolf packs are now documented both north and south of the project area, increasing the likelihood that they move through the area occasionally. Due to the fact that these predators would only use the project for transient movements,



combined with the project's negligible impacts to their prey species, Alternative 2 would "not likely to adversely affect" gray wolf, grizzly bear, and Canada lynx.

Northern spotted owl is documented to breed in the Stehekin Valley, approximately 1.5 miles north of the proposed maintenance facility site. The project site provides suitable foraging and dispersal habitat for the owl. Use of this area by owls would be discouraged by significant habitat fragmentation around the airstrip and a high level of human activity. Alternative 2 would remove less than one tenth of one percent of suitable owl habitat in the valley. For these reasons, the proposed project would "not likely to adversely affect" the northern spotted owl.

#### Other Special Status Species

Alternative 2 would have minor adverse impacts to suitable habitat for the western gray squirrel and pileated woodpecker. It would also have long-term benefits to aquatic-associated special status species from restoration of the riparian habitat at the existing maintenance facility.

Overall, impacts from past actions, together with the impacts of implementing Alternative 2, would result in minor adverse cumulative impacts to special status species in the Lake Chelan NRA.

#### **3.2.5.6 Alternative 3**

Alternative 3 would have similar minor adverse impacts to special status species from habitat removal and disturbance as Alternative 2. Similarly, Alternative 3 would have similar beneficial effects as Alternative 2. As described in section 3.2.3, Alternative 3 would remove slightly more habitat than Alternative 2 (2.7 acres compared to 2.5 acres). However, this difference will cause no measurable difference to special status species individuals or populations. The cumulative impacts and conclusions for Alternative 3 are the same as Alternative 2.

#### **3.2.5.7 Alternative 4**

Alternative 4 would have similar minor adverse impacts to wildlife resources from habitat removal and disturbance as Alternative 2. Similarly, Alternative 4 would have similar beneficial effects as Alternative 2. As described in section 3.2.3, Alternative 4 would remove slightly more habitat than Alternative 2 (2.8 acres compared to 2.5 acres). However, this difference will cause no measurable difference to wildlife individuals or populations. Western gray squirrel activity has been documented at the housing site for Alternative 4 (Stuart 2012). The cumulative impacts and conclusions for Alternative 4 are the same as Alternative 2.

### **3.2.6 VISITOR USE AND EXPERIENCE**

#### **3.2.6.1 Affected Environment**

##### ***Overview of Visitor Use and Amenities***

Since the late 19th century, large numbers of outdoor enthusiasts have been drawn to the North Cascades for physical and mental challenge, rest and relaxation, and enjoyment of scenic grandeur. Connected to the outside world only by foot, boat, or plane, the Stehekin Valley is nestled within the North Cascades in the southernmost part of the park. Stehekin serves as a hub to explore the nearly 63,000-acre Lake Chelan NRA and a gateway to the rest of the North Cascades National Park Complex, Stephen Mather Wilderness, and adjacent National Forest Wilderness Areas. Visitor use in the Stehekin Valley is generally concentrated in the lower nine miles. The project area includes the most used area of the lower Stehekin Valley, with multiple campgrounds, the boat landing, private residences, an airstrip, and the existing maintenance center, staff housing, and fire facilities.

Sightseeing, fishing, hunting, boating, horseback riding, and mountain climbing have been among the most favored activities (NPS 1995). Other activities include hiking, bicycling, tours, photography, camping, and rafting.

Lake Chelan NRA is a powerful landscape that includes one of the deepest lakes in North America, thundering waterfalls, spectacular spring dogwood blooms, and the scenic beauty of the free-flowing Stehekin River. Towering peaks surround the valley and are graced by glaciers. Ancient human occupation of this major mountain valley is marked by pictographs and stone artifacts, while current seasonal cabins and homes are dispersed through forests, pastures, and the historic Buckner Homestead. The legislation establishing Lake Chelan NRA specified conservation of scenic resources as one of the primary reasons for its establishment. The 1995 GMP included a detailed inventory of visual and scenic resources (NPS 1995). In summary, 16 different landscape types were identified in the valley from GIS analysis of topography and vegetation.

Annual visitation to Stehekin varies. Average visitation between 2000 and 2013 was 38,111 (visitation to Lake Chelan NRA, 2014). Visitor numbers have risen and fallen over the past, likely due to a host of factors related to the economy and tourism. Visitors come to experience the scenery and natural setting (78%), solitude, and access to wilderness; as well as other parts of the Lake Chelan NRA experience, including for wildlife, recreation/sports, and Stehekin Community, history and culture, among other reasons.



Stehekin Landing.

Visitors can access Stehekin via one of two commercial passenger boats, on foot, or by air on one of two recently available chartered floatplanes. Stehekin residents (including NPS employees) also depend on the boats for visitors, mail, groceries, and freight. A commercial barge provides services intermittently (about every ten days in summer and once a month during the rest of the year) to haul vehicles, fuel tanks, building materials, and other bulky freight items.

There is also a state-maintained emergency airstrip located in Stehekin about four miles from the Landing on Company Creek Road. It is operated by the Washington State Department of Transportation (WSDOT) Aviation Division under a special-use permit from the NPS. The airstrip, which is 2,630 feet long and 100 feet wide, is used for emergencies and by residents and visitors. WSDOT Aviation also identifies it for recreational use, firefighting, transportation access to a remote community, and flight safety enhancement; however, the NPS agreement cites it as an emergency airstrip.

### **Stehekin Community**

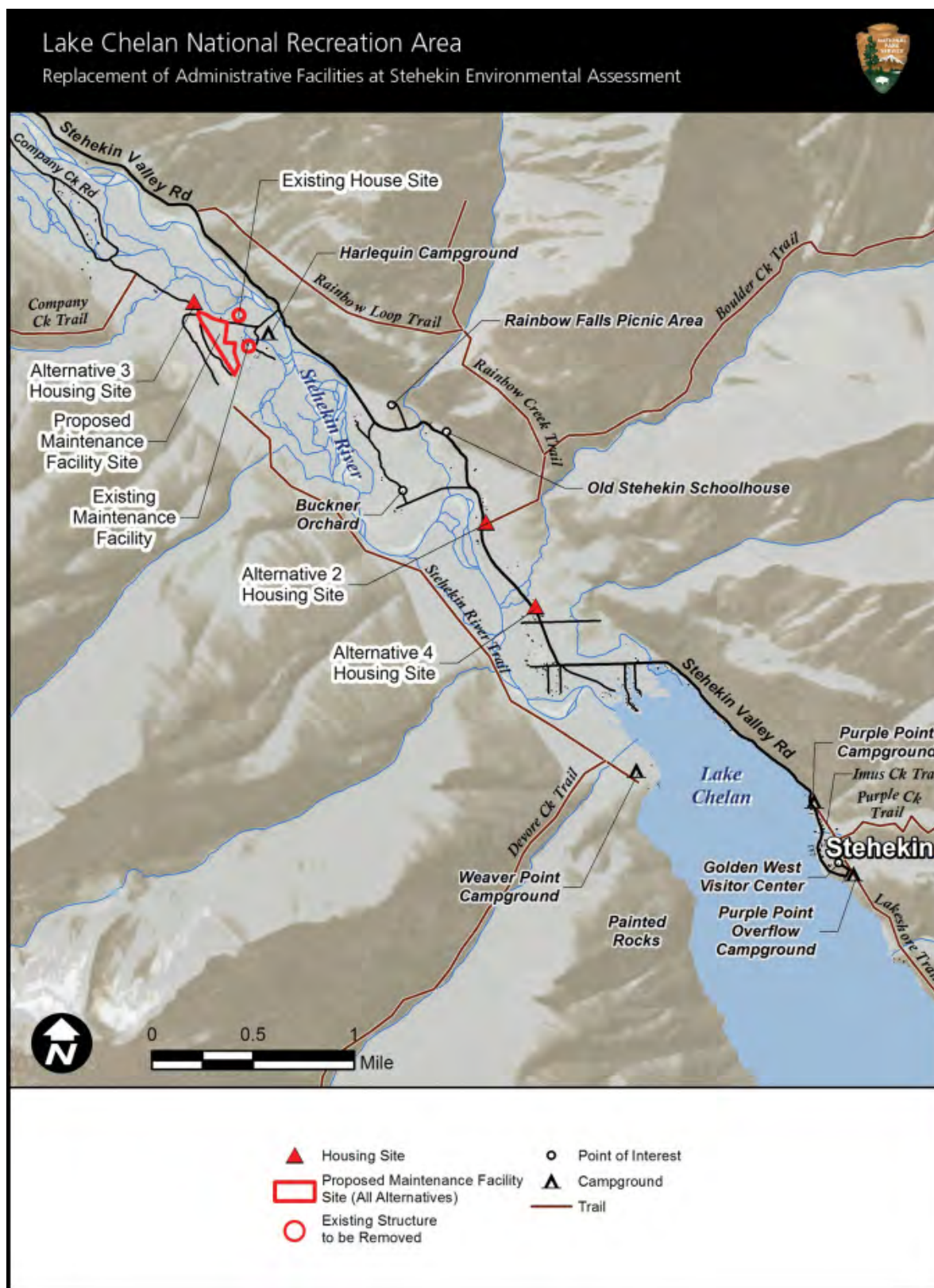
Approximately 60-90 people live in Stehekin year-round, with those numbers increasing by approximately 80 people during the summer. Residents include families who have lived in the valley for generations, as well as recently arrived homeowners. At the time of the GMP (1995), approximately one-third of the year-round residents were employed by the NPS or a concessioner, with today's numbers similar or only slightly lower. NPS estimates that approximately 36 private for-profit and non-profit businesses are currently based in and/or operate out of Stehekin (NPS 2012a). Just over half (19) of these businesses operate year-round, with the rest on a seasonal schedule (March-November or shorter). Two of the 36 businesses are concessions for the NPS.

The Stehekin Community is characterized by dispersed, low-density development, with higher-density clusters located at McGregor Meadows, along the Company Creek Road, and around the head of Lake Chelan (NPS 2012a). Development generally does not line the Stehekin Valley Road, rather it extends back from it, away from most areas seen by recreation area visitors. There are 191 housing units in Stehekin. The vacancy rate is 77%, meaning that only 23 percent of the housing units are lived in year-round.

### **Project Area**

The project area includes the existing and proposed locations of the maintenance facility and single-family residence. The existing facilities are located near the river, as shown in Figure 19.

Figure 19: Key Features Relevant to Visitor Use in the Stehekin Valley



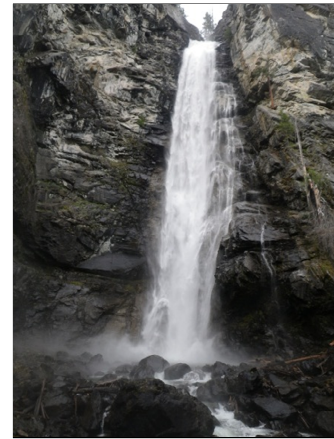


Visitor facilities in the project area include the northern end of Lake Chelan and approximately two miles to the north and northwest near Stehekin Valley Road. This area has several campgrounds, lodging facilities, and hiking trails. The project area can be accessed via the Stehekin Valley Road, traveled by a shuttle bus with four daily round trips during the summer, and twice daily in the spring and fall. Key features in proximity to the proposed facilities are:

- Harlequin Campground – located east of the airstrip and adjacent to Company Creek Road, with seven sites including a group campground.
- Rainbow Loop Trail (includes Rainbow Creek and Boulder Creek trails) – this 4.4-mile trail can be accessed from Stehekin Valley Road near one of the proposed housing sites, and brings hikers to open bluffs overlooking the Stehekin River Valley and historic Buckner Orchard.
- Stehekin River Trail – travels along the Stehekin River between Weaver Point Campground on Lake Chelan to an area just south of the airstrip area. This 4-mile trail is shaded and relatively level.
- Rainbow Falls – a scenic destination for visitors, Rainbow Falls is located just off Stehekin Valley Road and includes a picnic area and a short trail leading to view of the waterfall.



Rainbow Loop Trail Trailhead.



Rainbow Falls.

As described in Chapter 2, the existing maintenance facilities in Stehekin are some of the most basic and industrial structures in the valley. The maintenance buildings are wood-framed structures with metal siding and roofing, with a concrete building currently housing hazardous materials. The existing Fire Crew building is brick and has a board and batten shed extension to the rear. The buildings are eclectic in size, use, and material. The facilities are sized only based on need, and have been expanded in several cases, as needs changed over time.

### 3.2.6.2 Guiding Regulations and Policies

Key regulations and policies that guide the management of visitor use and experience in the project area are described in section 1.3. Some of the specific management objectives from the 1995 GMP pertinent to visitor use and experience include the following:

- *Visitors encounter facilities and services in a rural community context where needs are balanced with preservation of a nearly pristine natural environment (NPS 1995)*
- *The impacts of human activity on natural and cultural systems would be monitored to ensure protection of the resources (NPS 1995)*
- *[Manage the Stehekin River] as a dynamic natural system. Opportunities for visitors to appreciate the power and intricacy of the river as a natural system would be enhanced (NPS 1995)*

Other overarching guiding regulations can be found in the Enabling Legislation for Lake Chelan NRA (Public Law 90-544; October 2, 1968), as well as the NPS Organic Act of 1916, NPS *Management Policies* (2006), and NPS Director's Orders.

### Architectural Character Guidelines for Lake Chelan National Recreation Area

In an effort to preserve the rustic nature of the Stehekin cultural landscape and the pristine nature of the surrounding natural resources, the NPS developed Architectural Character Guidelines for the Lake Chelan NRA in 1993. The guidelines provide a study and summary of the existing historic and traditional building typologies in the Stehekin area and outline characteristics that contribute to a sense of place. These guidelines are intended for use in the design of all new structures, public or private, within Lake Chelan NRA.

#### **3.2.6.3 Impact Thresholds**

Impacts to visitor use and experience are assessed qualitatively based on professional assessment of the location of the proposed facilities and the effects of potential actions on the activities of the Stehekin community, different visitor populations, and various aspects of visitor use.

Impact thresholds for visitor use and experience are defined as follows:

- **Negligible:** Visitors would not be affected, or changes in visitor use opportunities would be below or at the level of detection. Any effects would be short term. Visitors and residents would likely be unaware of the effects associated with the actions.
- **Minor:** Changes in visitor use opportunities would be detectable, although the changes would be slight and likely short term. Visitors and residents would be aware of the effects associated with the actions, but the effects would be slight.
- **Moderate:** Changes in visitor use opportunities would be readily apparent and likely long term. Visitors and residents would be aware of the effects associated with the actions and would likely be able to express an opinion about the changes.
- **Major:** Changes in visitor use opportunities would be readily apparent and would have substantial long-term consequences. Visitors and residents would be aware of the effects associated with the actions and would likely express a strong opinion about the changes.

#### **3.2.6.4 Alternative 1 (No Action)**

##### ***Analysis***

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would continue. The existing maintenance facility would continue to be used. The existing housing structure would remain in place. Since no construction activity would occur, and hence no visual, traffic, or noise disturbances would occur, the No Action Alternative would have negligible effects on visitor use and experience.

The new fee structure at the existing transfer station would rely on a drop-off approach similar to the current operation. However, limited drop-off times will be less convenient for customers than the current operation. This scheduling limitation will result in minor adverse impacts on Stehekin residents and businesses.

Non-compliance associated with the new fee structure may also result in adverse impacts to visitors and residents. For instance, if residents of the valley increase illegal dumping of garbage and other waste in lieu of paying the fee, this could create a visual eyesore and odor for both visitors and residents. The extent and scope of these potential indirect impacts are unpredictable based upon the local response to the new fee structure. Therefore, potential impacts are considered minor adverse.

##### ***Cumulative Impacts***

The No Action Alternative, in combination with other Stehekin Valley Projects, would result in beneficial cumulative impacts on visitors to the Lake Chelan NRA. The improvements to the Stehekin ferry landing, Company Creek Road, and Stehekin Valley Road would improve safety and overall experience for visitors to the valley. These benefits would be offset by the limitations on drop-off times at the existing transfer station for Stehekin residents and businesses, resulting in negligible cumulative impacts for the Stehekin community.

**Conclusion**

Alternative 1 would contribute negligible impacts to visitor use and experience by avoiding construction activity. The limitations in drop-off for transfer station customers and potential visual eyesores and odor generated from non-compliance activities would result in minor adverse impacts. Cumulative impacts are beneficial for visitors and negligible for the Stehekin community.

**3.2.6.5 Alternative 2 (Preferred)****Analysis**

The proposed maintenance facilities are concentrated around the airstrip, west of Stehekin Valley Road and northwest of the Harlequin Campground, in a relatively flat area that has existing disturbed land. Since the majority of visitor use in Stehekin occurs well away from the project area, impacts to visitor use would largely be negligible during both construction and operation.

Short-term negligible to minor adverse effects would occur during construction. Residents and visitors near the construction areas would experience adverse impacts from construction-related activities such as noise, dust, and traffic, particularly at recreational sites and private properties adjacent to the project area. Construction activities such as demolition and truck traffic would result in short-term disruptions at Harlequin Campground and might be heard on the Stehekin River Trail. Truck traffic and construction of the Alternative 2 housing site would be both visible and audible from the Rainbow Creek Trail, potentially disrupting the quiet and solitude typically sought by hikers, resulting in minor adverse effects.

Construction supplies will be delivered by barge, and must be trucked up four and a half miles of paved and improved dirt roads. While construction would take place away from visitors, deliveries and short-term traffic control have the potential to interrupt visitor, resident, and shuttle bus traffic along Stehekin Valley Road and Company Creek Road. During peak summer tourist season, care would need to be taken to avoid traffic during the portion of the day that the ferry is docked. By managing traffic within the construction zone to minimize disruptions to visitor and resident traffic, potential adverse traffic impacts would be minor. Other standard avoidance and minimization measures (see section 2.5.6) would be implemented during construction to minimize noise, dust, and traffic to ensure that potential short-term adverse effects on private residents and visitors are minor.

There would be long-term visual changes for park visitors and residents who would see an additional home and the new maintenance facility within the project area. The new maintenance facility would be visible to visitors and residents accessing the area via plane and from sections of the Stehekin River Trail. The airstrip is an existing area of disturbance and the new facility would be located immediately adjacent to the airstrip, so it doesn't stand out against the natural landscape. The existing maintenance facility and staff residence along Company Creek Road would also be removed and restored to more natural conditions, visually off-setting the construction of the new facilities.

The limitations in drop-off for transfer station customers and potential adverse impacts associated with non-compliance activities such as illegal dumping would be the same as Alternative 1.

The Alternative 2 housing site would also be visible to users of the Rainbow Creek and Boulder Creek trails, visitors riding the shuttle bus, and residents using Stehekin Valley Road for transport. However, the house would be located in an area with existing residences and would be designed to match the local style. As detailed in section 2.3.2.2, all of the new structures would incorporate principles of sustainable design and would mimic the local vernacular to blend with the surrounding landscape. Existing vegetation would be preserved where possible. Upon implementation of these avoidance and minimization measures (section 2.5.6), potential visual impacts to both visitors and residents would be negligible to minor adverse.

Traffic patterns around the maintenance facility would change slightly, with traffic entering and exiting the facility slightly farther north, which would make vehicles drive past a few additional houses. However, all of these changes are negligible because the house would be near existing homes and existing traffic volumes would not change.



The new maintenance facility and residence are not part of the interpretive program and would not be open to the visiting public. They would, however, be important park resources to support the visitor experience over the long term. Thus, improvements to these facilities would have beneficial impacts to visitor use and experience through improvements to overall park operations (see section 3.2.8). For example, there would be fewer interruptions to visitor use and experience during fire-fighting activities by concentration of fire support personnel and equipment at the new maintenance facility (e.g., relocation of the fire cache from the Landing).

### **Cumulative Impacts**

Alternative 2, in combination with other Stehekin Valley Projects, would result in beneficial cumulative impacts on visitors to the Lake Chelan NRA. The improvements to the Stehekin ferry landing, Company Creek Road, and Stehekin Valley Road would improve safety and overall experience for visitors to the valley. The new maintenance facility would also benefit visitor use and experience through improvements to overall park operations. For Stehekin residents and businesses, these benefits would be offset by the limitations on drop-off times at the existing transfer station and generation of noise, dust, and traffic during construction of the remaining improvements on Stehekin Valley Road and the new maintenance facility and housing site. Overall, cumulative impacts for the Stehekin community are negligible.

### **Conclusion**

Alternative 2 would have short-term minor adverse effects on visitors and residents due to noise, dust, and traffic during construction. Potential visual impacts to both visitors and residents would be minor adverse due to the presence of the new maintenance facilities and the new housing site adjacent to Rainbow Creek Trail. The limitations in drop-off for transfer station customers and potential visual eyesores and odor generated from non-compliance activities would result in minor adverse impacts. Beneficial impacts include improved park operations due to the concentration of facilities near the airstrip. Cumulative impacts are beneficial for visitors and negligible for the Stehekin community.

#### **3.2.6.6 Alternative 3**

##### **Analysis**

The potential effects of Alternative 3 are the same as Alternative 2, except the staff housing site near the new maintenance facility would avoid adverse impacts to users of the Rainbow Creek and Boulder Creek trails, both during construction and operation. Potential impacts would be concentrated near the airstrip.

##### **Cumulative Impacts**

Cumulative impacts of Alternative 3 are the same as Alternative 2.

##### **Conclusion**

Same as Alternative 2, except the housing site would not have adverse impacts to users of the Rainbow Creek and Boulder Creek trails. Cumulative impacts are beneficial for visitors and negligible for the Stehekin community.

#### **3.2.6.7 Alternative 4**

##### **Analysis**

The potential effects of Alternative 4 are the same as Alternative 2, except the staff housing site along Stehekin Valley Road and closest to the Landing would avoid adverse impacts to users of the Rainbow Creek and Boulder Creek trails, both during construction and operation. Construction of the new house would result in potential short-term impacts to existing residents located along the roadway and visitors traveling along the road on foot or via the shuttle bus. Since the site is closest to the Landing, potential traffic disruptions during construction are the least compared to Alternatives 2 and 3.

##### **Cumulative Impacts**

Cumulative impacts of Alternative 4 are the same as Alternative 2.

**Conclusion**

Same as Alternative 2, except the housing site would not have adverse impacts to users of the Rainbow Creek and Boulder Creek trails. Alternative 4 would have the least overall impact to visitors and residents during construction, since the housing site is closest to the Landing. Cumulative impacts are beneficial for visitors and negligible for the Stehekin community.

**3.2.7 PUBLIC HEALTH AND SAFETY****3.2.7.1 Affected Environment**

The project area includes the existing and proposed locations of the maintenance and fire facilities and the waste transfer station. The current facilities are located in the CMZ and at the edge of the floodplain, as shown in Figure 20.

The main public health and safety concerns for this project relate to flood risk, proximity to an active alluvial fan, fire risks, and interactions between humans and wildlife. These are described in greater detail below and addressed in the assessment of impacts.

The Chelan-Douglas Health District provides physical health services to the population within its service area, which includes the Lake Chelan NRA. This agency is also a regulatory agency with jurisdiction over environmental aspects such as water supply, sanitation, and land use development. The nearest hospital to the project area is the Lake Chelan Community Hospital located almost fifty miles away at the south end of Lake Chelan.

**Flood Risk**

The maintenance facility contains numerous sources of potential pollution, such as heavy equipment; storage of paints, solvents, and pesticides; and solid waste collection sites. During extreme flooding the potential release and dispersion of hazardous substances poses some risk to public health and safety and natural resources. In addition, outdated septic systems currently located in the CMZ could degrade water quality, contaminate soils, and potentially pose public health concerns (see section 3.2.1, Stehekin River CMZ and Floodplains, for more information).

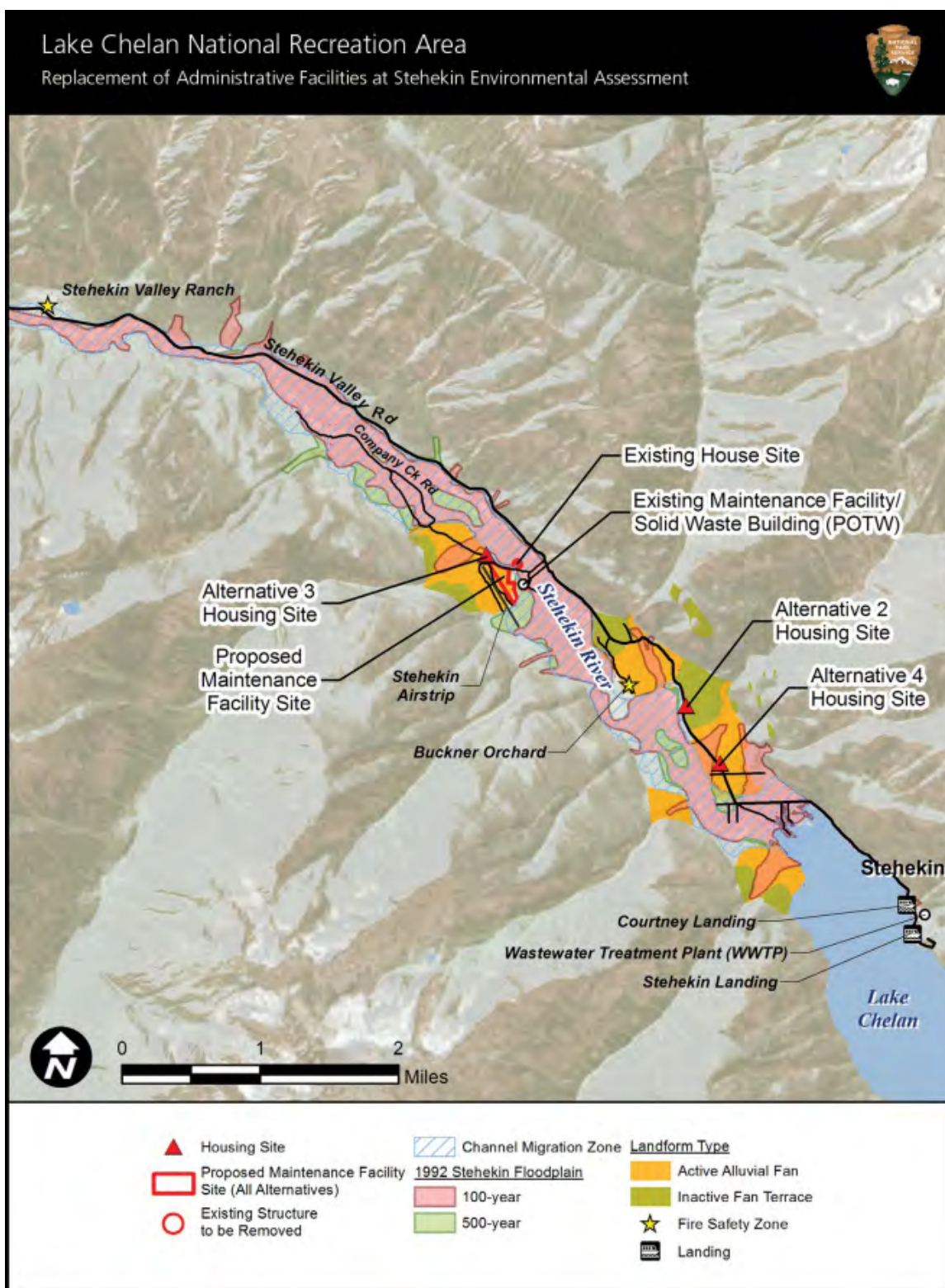
**Alluvial Fan**

The Company Creek alluvial fan is upland from the existing maintenance facility. This is an active alluvial fan with the potential for flooding during high water events. Debris slides and mud flow have never been observed on this alluvial fan. Flooding across the surface of the alluvial fan is very infrequent and takes an exceptionally heavy rainfall for this to occur. Currently, flooding from this alluvial fan does not threaten the NPS facilities. If floodwaters were to come across the alluvial fan, they would naturally flow down existing dry channels, providing an element of predictability to the direction of such floodwaters. The location of the proposed facilities relative to the alluvial fan is discussed in section 3.2.2.1, Surficial Landforms. Potential risks to the proposed facility are discussed in more detail below in the analysis of alternatives.

**Fire Risks and Management**

The Stehekin Valley is a narrow forested valley with limited access. The valley's Douglas fir/ponderosa pine forest shows characteristic signs of being at risk of a stand-replacing fire. The community of Stehekin within this valley is home to roughly 60-90 residents year-round, in addition to hosting a summer tourist population of approximately 140-170 persons per day. There are currently two safety zones that can be utilized in a catastrophic fire event – one at the Buckner Orchard and one at the Stehekin Valley Ranch (Figure 20). The escape route to these locations is the Stehekin Valley Road. The NPS provides wildland fire protection for federal lands in Stehekin. Through a memorandum of agreement with the Department of Natural Resources, the NPS also assists the local fire district with an initial attack response for wildland fire on non-federal land. The NPS is not equipped, staffed, or trained to provide structural fire protection services in Stehekin.

Figure 20: Key Features Relevant to Health and Safety in the Stehekin Valley



### **Human/Wildlife Conflicts**

The existing maintenance facility is in a wooded setting within the Lake Chelan NRA. The habitat quality here is favorable for many wildlife species. Some relatively common wildlife species, such as black bears and birds, can be attracted to the site due to the scents and potential rewards associated with garbage and compost. These attractants have the potential to create conflicts between humans and the local wildlife, which is a public safety concern.

#### **3.2.7.2 Guiding Regulations and Policies**

Key regulations and policies that guide the management of public health and safety in the project area are described in section 1.3. Management objectives from the 1995 GMP pertinent to public health and safety seek to ensure, “... *that land uses on public and private lands are compatible with the purposes of Lake Chelan NRA, emphasizing those uses that protect natural and cultural resources and natural processes, and provide for safe visitor facilities and services.*”

Other overarching guiding regulations can be found in the Enabling Legislation for Lake Chelan NRA (Public Law 90-544; October 2, 1968), as well as the NPS Organic Act of 1916, NPS *Management Policies* (2006), and NPS Director’s Orders.

#### Chelan County Code, Flood Hazard Development

Development in flood hazard zones is limited by Chelan County Code, Section 3.20.040, Purpose:

*It is the purpose of this chapter to promote the general public health, safety, and welfare, and to minimize public and private losses due to flood conditions in specific areas, by providing standards designed to:*

- *protect human life and health;*
- *minimize the need for rescue and relief efforts associated with flooding and usually undertaken at the expense of the general public;*
- *minimize prolonged business interruptions;*
- *minimize damage to public facilities and utilities, such as water and gas mains and electric, telephone, and sewer lines, and streets and bridges located in flood hazard areas; and*
- *ensure that those who occupy the flood hazard areas assume responsibility for their own actions.*

#### Chelan County Emergency Resolution #2007-42

On March 12, 2007, Chelan County issued an Emergency Resolution (#2007-42) declaring an “*imminent danger at several locations in the Stehekin River and upper Lake Chelan due to increased flooding risk.*” The purpose of the Resolution was to “*request that the Washington State Department of Fish and Wildlife issue an expedited written permit to perform work to reduce the flooding risk in the Stehekin Community.*” The Resolution identified several specific locations for flood protection measures, including upper Company Creek Road, based on concerns voiced by landowners and recommendations provided by the Corps, Emergency Management Division (NPS 2007).

#### **3.2.7.3 Impact Thresholds**

Direct impacts to public health and safety for this project are assessed qualitatively based on past studies which identified specific problems in the project area. Impact thresholds for public health and safety are defined as follows:

- **Negligible:** Impacts would be imperceptible or not detectable. There would be no or minimal risk to public health and safety.
- **Minor:** Impacts would be perceptible but localized in a small portion of the project area, without the potential to expand if left alone. Exposure to hazards would occur infrequently and only for those in close proximity to the facility.

- **Moderate:** The potential to encounter hazards would be widespread throughout the project area or within a specific portion of the project area. Professionals would be required to assist with controlling active hazards. Risk to public safety would be higher with the development of the action and likely long-term.
- **Major:** Threats to public health and safety would be widespread throughout the project area and would have substantial long-term consequences. Professionals would be required frequently to help protect life and health. Risk to public safety would be substantially higher and long-term with the development of the action.

#### 3.2.7.4 Alternative 1 (No Action)

##### **Analysis**

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would continue. The existing maintenance facility would continue to be used. Operation of the maintenance facility and current housing has minor negative impacts to public health and safety due to risks for flooding affecting the maintenance facility (risk of exposure due to potential release of hazardous materials and sewage).

The existing facility and housing is not at risk from the Company Creek alluvial fan.

The moderate potential for fires is a possibility that would remain unchanged under Alternative 1. While the damage a fire could inflict on the maintenance facility categorizes this risk as moderate, the possibility of a fire during any given year is remote, with the greatest potential being during the dry summer months. Under Alternative 1, the closest fire response facility is located at Stehekin Landing.

The minor potential for human-wildlife conflicts would remain unchanged under Alternative 1.

##### **Cumulative Impacts**

The primary risks to public health and safety throughout the valley are the potential for fires or flooding. Past projects in the Stehekin Valley have generally reduced risks to public health and safety particularly providing protection from flood damage. These naturally occurring hazards are infrequent but would be widespread. Therefore, the cumulative adverse risks to public health and safety throughout the valley are considered moderate. Alternative 1 proposes no new action or construction in the Stehekin Valley and, therefore, does not increase or decrease risks to public health and safety. Because Alternative 1 would not affect public health and safety, cumulative effects from the maintenance facility and other actions would remain moderate adverse.

##### **Conclusion**

Alternative 1 does not alter the current level of risk to public health and safety in the project area. Alternative 1 would result in moderate adverse cumulative impacts to public health and safety throughout the valley.

#### 3.2.7.5 Alternative 2 (Preferred)

##### **Analysis**

During construction of Alternative 2, there could be short-term, negligible to minor adverse effects from risks typical during construction. These safety issues would not affect the general public and would be limited to active construction activities. Safety on construction sites is generally a high priority for contractors who train personnel regarding safety and require protective gear while on site, which greatly reduces the risk of injuries.

Alternative 2 would benefit visitor, resident, and/or employee safety by relocating the maintenance facility and one residence out of the Stehekin River floodplain and CMZ. This would diminish the risk of hazardous materials from the maintenance facility and sewage from the one residence contacting floodwater.

The proposed location of the maintenance facility for Alternative 2 sits on the active Company Creek alluvial fan. This geological feature was created by the deposition of sediment during flooding events

on Company Creek. Currently, Company Creek flows north of the proposed facility location. Large flooding events with the potential to deliver additional landform-building sediment are extremely rare and, in recent history, mudslides and debris flows have not been observed on the Company Creek alluvial fan. The more likely event that would pose risk to the facility is the potential for flooding across the alluvial fan. During an extreme event when Company Creek overtops its banks, floodwater can follow any number of existing pathways across the alluvial fan. Figure 21 shows potential floodwater pathways that could be occupied during a large flood with the most likely path in dark green. Floodwater crossing through the maintenance facility is a minor safety risk to NPS staff.

Figure 22 shows the potential floodwater pathways relative to the maintenance facility layout for Alternative 2. The maintenance building, fuel site, and warehouse on the north end of the property are at the most risk because they are closest and, in some cases intersect with, the potential flood-flow paths. This risk to safety could be mitigated by a variety of actions including the following:

- Prepare an early warning detection strategy (i.e. be aware of the severity of incoming storm events) and a robust evacuation plan for the facility.
- Construct buildings with base floor elevations raised 1 to 2 feet above ground level to accommodate flooding.
- Ensure that dry channels, which could become reoccupied, are not blocked by buildings or equipment.
- Consider earthwork that could deflect or define flow routes.

Flooding across an alluvial fan can sometimes result in the main channel, in this case Company Creek, relocating (avulsing) to another pathway. It is assumed that if a channel avulsion (channel moved to a new pathway) were to occur, the NPS would elect to redirect the flow back into the original channel under the Company Creek Bridge. In this case, the damage from a channel avulsion would be temporary.

The housing location for Alternative 2 is on an inactive fan terrace between the Boulder Creek and Rainbow Creek alluvial fans and, therefore, would not be at risk from alluvial fan activity.

Alternative 2 would benefit public health and safety by developing a new 3,300-square-foot fire facility that would improve conditions for fire crews during fire season and provide resources for search and rescue operations. This alternative would also continue to maintain access for emergency services such as emergency medical services, search and rescue, and fire suppression.

Alternative 2 would have a similar potential for human-wildlife conflicts as the existing facility, because the new facility would include a waste transfer station. Scents and potential rewards associated with garbage and compost are known attractants for wildlife. However, this issue would be improved compared to the No Action Alternative, because waste would be more appropriately contained and covered than under existing conditions.

In addition, this alternative would reduce employee exposure to cramped conditions and hazardous materials, including asbestos, lead-based paint, and rodent infestations by providing new buildings that would be up to current building codes.

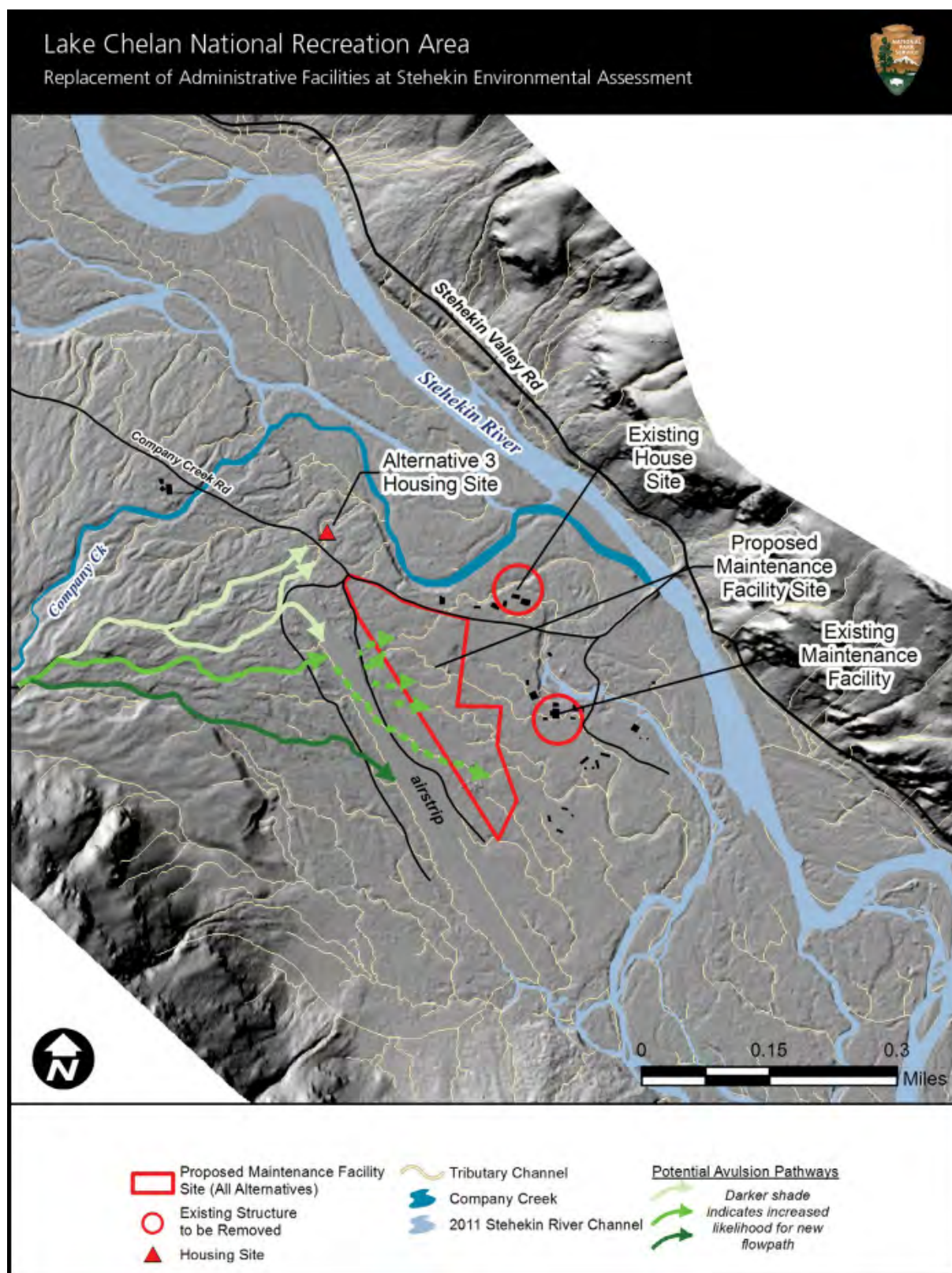
Developing facilities near the Stehekin Airstrip may also pose safety concerns to staff during emergency aircraft landings, although Federal Aviation Administration setback requirements would be followed to mitigate this unlikely, minor risk.

### ***Cumulative Impacts***

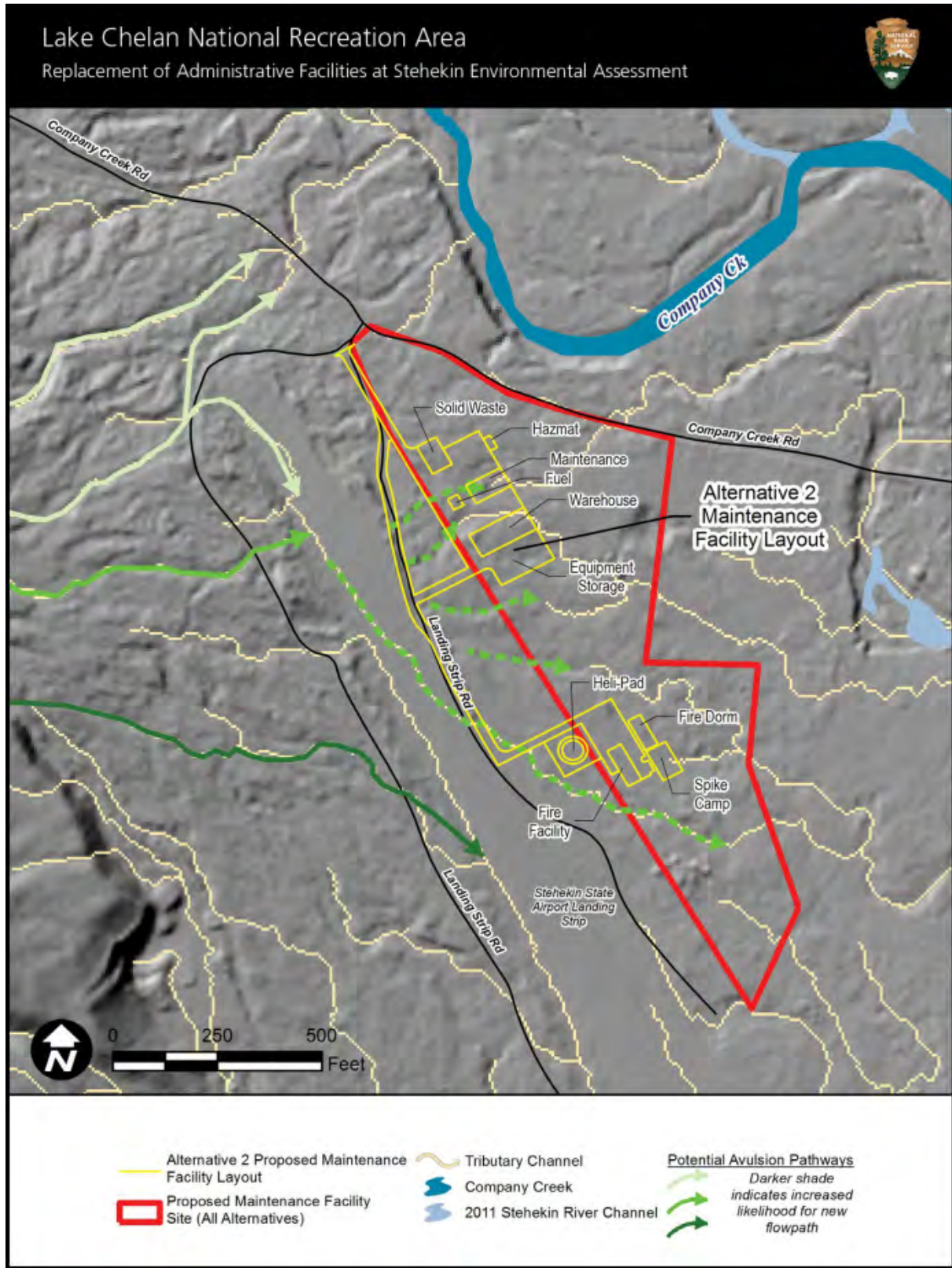
Alternative 2 would contribute a variety of beneficial impacts on visitor, resident, and employee safety. Because the effects of this alternative are primarily beneficial, this project would provide a cumulative benefit to public health and safety in the Stehekin Valley. However, the one adverse impact associated with this alternative would be moving the facility onto the Company Creek alluvial fan. This action increases risk to NPS employees and therefore adds to cumulative risks to employees within the valley. Overall, Alternative 2 would result in moderate adverse cumulative impacts in the valley.



Figure 21: Potential Channel Avulsion of Company Creek



**Figure 22: Alternative 2 Potential Channel Avulsion of Company Creek**





### **Conclusion**

Alternative 2 would benefit public health and safety by improving emergency response facilities. This alternative would also benefit or at least not change the potential for human-wildlife conflicts. The location of this facility on an active alluvial fan introduces the risk of a very rare but minor adverse impact from flooding. The risk from Stehekin River flooding under existing conditions is also minor. Therefore, the risk threshold relative to flooding at the new maintenance facility is unchanged from existing conditions. However, flooding across the alluvial fan would be much less frequent than flooding from the Stehekin River. Alternative 2 would result in moderate adverse cumulative impacts.

#### **3.2.7.6 Alternative 3**

##### **Analysis**

Benefits and impacts from Alternative 3 would be the same as those described for Alternative 2 with the exception that the housing location for Alternative 3 is also on the active Company Creek alluvial fan and is closer to the creek than the maintenance facility. This location introduces a minor risk to the proposed house from infrequent alluvial fan flooding that would most likely cross the driveway and flow around the house itself. As with the maintenance facility, the flood risk to the house is much less than the risk from frequent Stehekin River flooding under existing conditions.

Figure 23 shows the potential floodwater pathways relative to the maintenance facility layout for Alternative 3 and the housing site. Buildings with the most risk for flooding include the fire facility, solid waste site, maintenance building, and warehouse. Mitigation measures listed under Alternative 2 would be equally effective for Alternative 3.

##### **Cumulative Impacts**

Cumulative impacts from Alternative 3 would be the same as those described for Alternative 2.

##### **Conclusion**

Alternative 3 would have both beneficial effects and potential minor adverse impacts to public health and safety equal to those for Alternative 2 with one exception. The housing location for Alternative 3 is also on the Company Creek alluvial fan and is therefore at greater risk than for Alternative 2. Alternative 3 would result in moderate adverse cumulative impacts.

#### **3.2.7.7 Alternative 4**

##### **Analysis**

Benefits and impacts from Alternative 4 would be the same as those described for Alternative 2 with the exception that the housing location for Alternative 4 is on the active Boulder Creek alluvial fan. This location puts the proposed house at greater risk from infrequent alluvial fan flooding than for Alternative 2, but both alternatives are at less risk from frequent Stehekin River flooding than under existing conditions. Potential floodwater pathways across the Boulder Creek alluvial fan have not been mapped. However, design for this site has placed the house clear of existing dry channels that could carry water during a flood.

Figure 24 shows the potential floodwater pathways relative to the maintenance facility layout for Alternative 4. Structures with the most risk for flooding are the fire facility and fire dorm. Mitigation measures listed under Alternative 2 would be equally effective for Alternative 4.

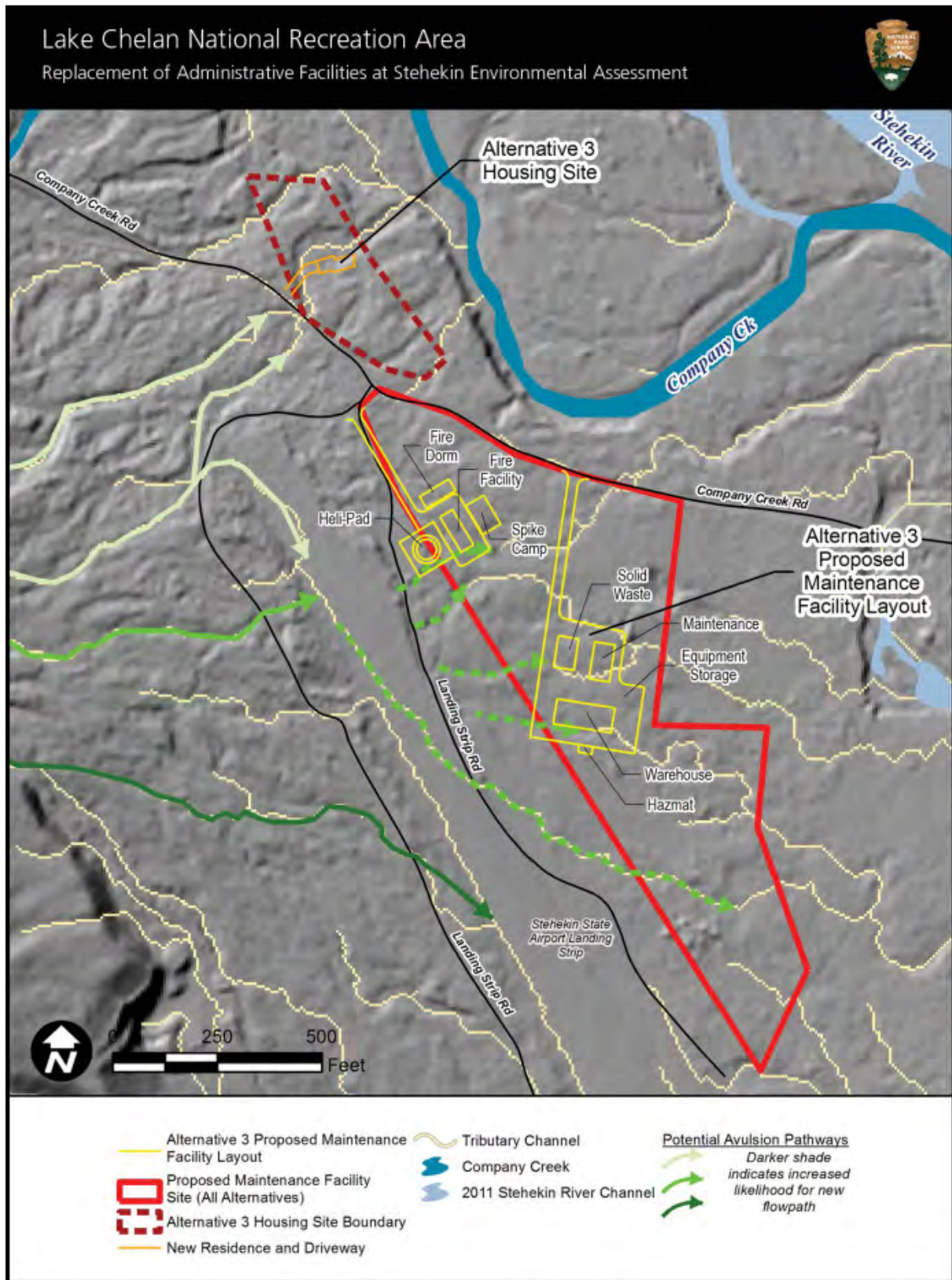
##### **Cumulative Impacts**

Cumulative impacts from Alternative 4 would be the same as those described for Alternative 2.

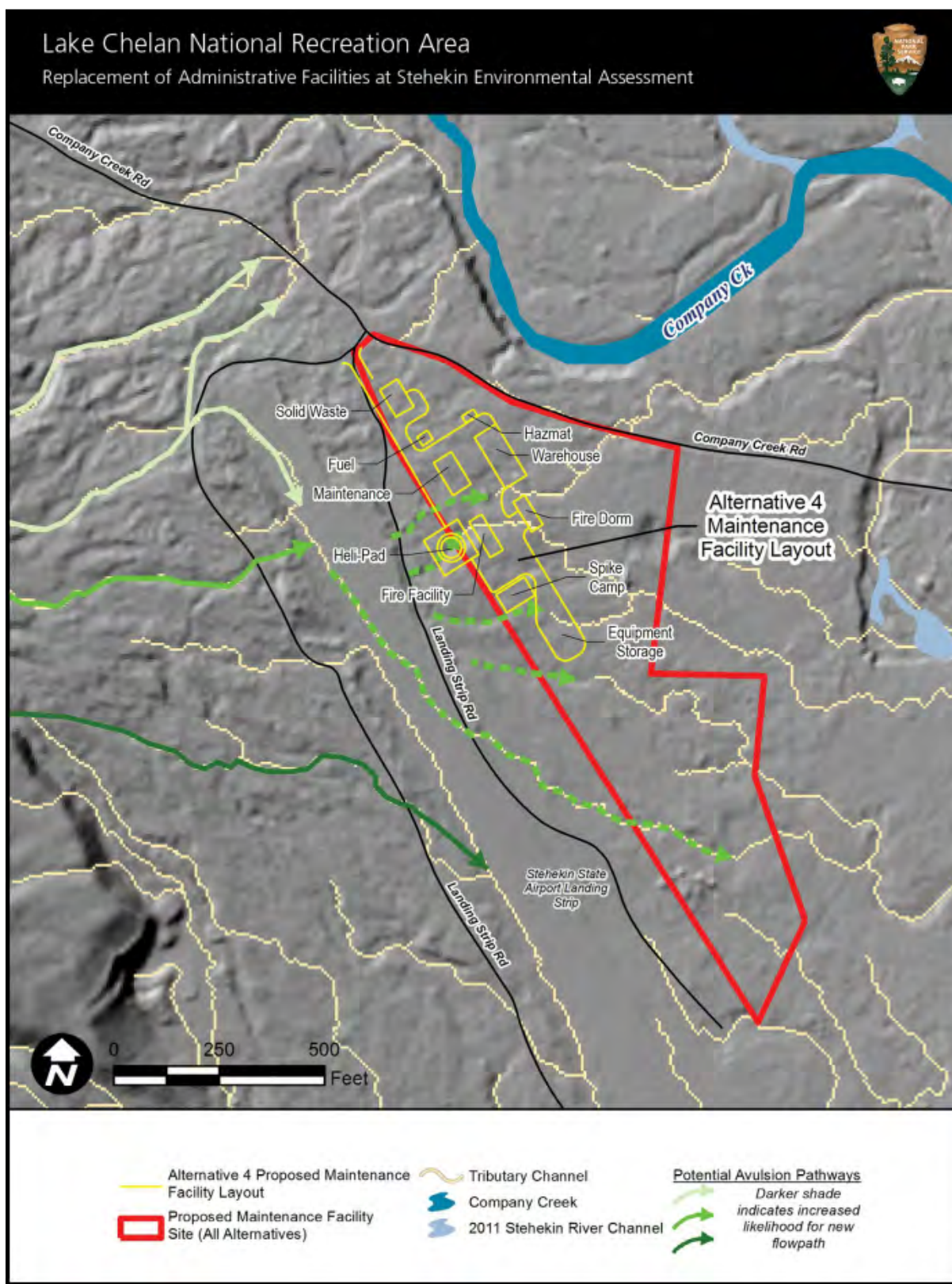
##### **Conclusion**

Alternative 4 would have both beneficial effects and potential minor impacts to public health and safety equal to those for Alternative 2 with one exception. The housing location for Alternative 4 is also on the Boulder Creek alluvial fan and is therefore at greater risk than for Alternative 2. Alternative 4 would result in moderate adverse cumulative impacts.

**Figure 23: Alternative 3 Potential Channel Avulsion of Company Creek**





**Figure 24: Alternative 4 Potential Channel Avulsion of Company Creek**

### 3.2.8 PARK MANAGEMENT AND OPERATIONS

#### 3.2.8.1 Affected Environment

The project area includes the existing and proposed locations of the maintenance facility and staff housing.

##### *Overview of Park Operations*

Approximately 20 to 35 NPS employees work in Stehekin. Park operations fulfilled by NPS employees in Stehekin include a variety of administrative activities, maintenance activities (roads, trails, orchard, historic structures, buildings, utilities, and housing), resource management activities (native and non-native plant and wildlife management, fire/fuels management, research, inventory, monitoring, and restoration), law enforcement, and visitor services activities (search and rescue and other emergency services, interpretation, and visitor center operations).

NPS staff in Stehekin provides vital services to visitors and residents while working from, and living in, deteriorating structures inherited from other organizations or individuals. The dilapidated, single-family residence within the project area along Company Creek Road is located within the 100-year floodplain and CMZ and is subject to frequent flooding. NPS employees residing within the house are temporarily relocated during flood events.

Company Creek Road is an NPS road, and was originally part of the Stehekin Valley Road. It is now used for access across the Stehekin River from the current Stehekin Valley Road. Company Creek Road is a 2.2-mile-long one-lane road with some private parcels across it, occasional turnouts, and a crushed aggregate surface. It provides the only access to numerous private parcels, Harlequin Campground, the hydroelectric power plant, the NPS maintenance area, the Company Creek Gravel Pit, and the airstrip on the southwest side of the Stehekin River. Company Creek Road is plowed by NPS staff in the winter. In the spring and fall it is often subject to flooding, particularly in its upper and lower portions, near the NPS maintenance area and Mileposts 2.1 to 2.2. Other portions of the road have received floodwaters in the last several major floods, with portions of the road being damaged or lost and rebuilt in place. NPS staff prioritizes road work during flood events in order to maintain access throughout the valley.



Company Creek Road near entrance to airstrip (looking toward Alternative 3 housing site).

##### *Maintenance Facility*

The existing maintenance facility is within the 100-year floodplain and is subject to inundation and flood damage during peak flows. The facilities were constructed between the 1940s and 1980s or were inherited from the U.S. Forest Service. The poorly designed facility compound includes a collection of cramped, poorly lit, under-insulated buildings, generally not constructed to function as maintenance facilities. These facilities are inadequately designed to handle snow load. Roof pitch and physical locations make it difficult to remove snow. The carpenter shop roof must routinely be hand shoveled to prevent collapse. The carpenter shop is also over one-quarter mile away from the rest of the maintenance facility, resulting in lost productivity and additional vehicle cost. Buildings are inadequately insulated and are heated with various systems, including propane and electric heating. Due to the distance from supply facilities, extra parts for each of these must be kept on hand.

##### *Fire and Emergency Services*

The NPS provides wildland fire protection for federal lands in Stehekin. Through a Memorandum of Agreement with the Department of Natural Resources, NPS also assists the local fire district with an initial attack response for wildland fire on non-federal land. The NPS is not equipped, staffed, or trained to provide structural fire protection services to Stehekin. NPS fire staff in Stehekin ranges from 3 to 10 on a regular basis, increasing to 20 to 50 during fires or fuel treatment operations. Fire crews



and equipment are currently provided out of the “Hilton” at the Landing. The Hilton sleeps four people and includes a covered/enclosed space to store one emergency vehicle and fire cache equipment. The Stehekin Airstrip is used as a command center during fire events, providing staging and serving as a heliport.

### **Waste Management Services**

An overview of waste management services provided by NPS is provided in section 1.2.2. Trash containers are placed in public areas and are serviced by NPS staff during custodial rounds. Collected trash is transported to the existing transfer station for compaction and interim storage. All other trash within the valley is delivered to the transfer station by the generators (residents, businesses, etc.). NPS staff compacts trash delivered from NPS sources, public, and private generators; the lodge (concessioner) is required to deliver and compact its own waste. All compacted trash is combined and stacked on pallets for interim storage, until it is loaded onto a (contracted) boom truck and transported to the Landing and loaded onto a (contracted) barge and shipped down the lake for final disposal.

Given the labor-intensive nature of the current waste management operations, all NPS maintenance staff in Stehekin support the operations to some extent (NPS 2014c). In 2010, 11 NPS maintenance employees at pay grades ranging from WG-05 (Maintenance Worker) to WS-09 (Maintenance Mechanic Supervisor) spent approximately 1,000 labor hours in the existing transfer station processing garbage and trash.

### **3.2.8.2 Guiding Regulations and Policies**

Key regulations and policies that guide park management and operations in the project area are described in section 1.3. Other applicable plans, policies, and ordinances relevant to park management and operations are summarized below.

#### Lake Chelan National Recreation Area Transportation Plan

**Maintenance Facility:** A new maintenance facility will be constructed near the airstrip, including shuttle bus storage and maintenance, equipment, a repair building, a search and rescue fire cache, and a helicopter pad. Hazardous material, propane, and gasoline storage and NPS vehicle fuel storage and dispensing will also be relocated to the airstrip area in a safe area outside the 500-year floodplain. The future use or removal of the existing maintenance facility has yet to be determined; however, any use would be compatible with floodplain management guidelines (NPS 1995).

#### Architectural Character Guidelines for Lake Chelan National Recreation Area

In an effort to preserve the rustic nature of the Stehekin cultural landscape and the pristine nature of the surrounding natural resources, the NPS developed *Architectural Character Guidelines for Lake Chelan National Recreation Area* in 1993 (Jones and Jones). The guidelines provide a study and summary of the existing historic and traditional building typologies in the Stehekin area and outline characteristics that contribute to a sense of place. These guidelines are intended for use in the design of all new structures, public or private, within the Lake Chelan NRA.

#### Chelan County Code, Flood Hazard Development

Development in flood hazard zones is limited by Chelan County Code, per Section 3.20.040, Purpose.

*It is the purpose of this chapter to promote the general public health, safety, and welfare, and to minimize public and private losses due to flood conditions in specific areas...*

### **3.2.8.3 Impact Thresholds**

Impacts for each action alternative were evaluated by identifying changes to operations outlined in each of the action alternatives. These effects were compared to existing operations, staffing, and funding. Park operations impacts were considered within the project area.

Impacts on park operations would result from the need for additional staffing or changes in duties for current staff, changes in funding levels, changes in facilities, and from cost-saving measures associated with new facilities. Planning and implementing projects requires staff time, expertise, and

assistance, which must be taken from daily duties such as visitor contacts, interpretation, resource protection, and safety.

Adverse impacts would increase staffing, operating costs, or energy consumption.

Beneficial impacts would decrease these. With beneficial impacts, the efficiency of park operations would also be improved and may lower the overall cost of operation. The discussions of impacts are for those operations that would be new, undergo major operational change, or show susceptibility to increases or decreases in operational activity. For example, old facilities would require additional staff time to operate or maintain, whereas replacement of facilities would likely use existing staffing levels. Impacts on park management and operations would result from the need for additional staffing or changes in duties for current staff, changes in funding levels, and from cost-saving measures associated with new facilities.

Intensity of Impact:

- **Negligible:** Park operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on park operations.
- **Minor:** The effects on park operations would be detectable but would be of a magnitude that would not have an appreciable effect on park operations.
- **Moderate:** The effects on park operations would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public.
- **Major:** The effects on park operations would be readily apparent, would result in a substantial change in park operations in a manner noticeable to staff and the public, and would be markedly different from existing operations.

#### **3.2.8.4 Alternative 1 (No Action)**

##### ***Analysis***

Under the No Action Alternative, existing NPS practices within the Stehekin Valley would largely continue. The existing maintenance facility would remain in its current location in the floodplain and CMZ. NPS would continue to accept community waste at the existing transfer station under a newly implemented fee system. Changes to the solid waste processing fee structure (see section 2.3.1.1) would require NPS to set up and administer a fee collection and billing system, and maintain staffed operating hours at the existing transfer station. The fees collected from the new billing system would provide additional funding to maintain park facilities. The logistics and staffing associated with the new fee structure would result in a minor adverse impact to park operations. Solid waste handling / cleanup and law enforcement associated with potential increases in illegal dumping of trash due to fee implementation would also result in a minor adverse impact to park operations.

##### ***Cumulative Impacts***

Improvements to the ferry landing, Company Creek Road, and Stehekin Valley Road would improve access and safety, resulting in beneficial impacts to park operations. Moving the hazardous materials trailer would also benefit park operations by reducing flood risk, exposure or spills of hazardous materials, and the risk of disruptions to access for the facility. Floodproofing measures at the existing maintenance facility would further reduce the risk of water damage to the buildings and contents. However, depending on the severity of a given flood event, water would still inundate the maintenance facility property, surrounding buildings and depositing mud and debris that would need to be cleaned away once flood waters had receded. In combination with the minor adverse impacts anticipated with implementation of a fee collection and billing system at the existing transfer station, cumulative impacts to park operations would be minor adverse.

##### ***Conclusion***

Alternative 1 would result in minor adverse impacts to park operations and management due to implementation of a fee collection and billing system for waste management services, as well as solid waste cleanup and law enforcement associated with potential increases in illegal dumping. The

maintenance, solid waste, and housing structures would remain in poor condition with maintenance backlogs and poor siting. Despite beneficial impacts due to access improvements, relocation of the hazardous waste trailer, and implementation of floodproofing measures, overall cumulative impacts would be minor adverse.

### 3.2.8.5 Alternative 2 (Preferred)

#### **Analysis**

Alternative 2 would construct a new maintenance facility and fire facilities in a consolidated area near the Stehekin Airstrip (see section 2.3.2.1), out of the floodplain and CMZ. This is consistent with NPS plans, which call for comprehensive design and construction of a replacement maintenance compound near the airstrip. Replacement and relocation of the maintenance area and fire cache to an area not subject to flooding would result in long-term protection of NPS buildings, structures, and staff. Construction of new staff housing within the valley, outside of the floodplain and CMZ, would also result in improved working and living conditions for NPS staff.

Emergency response to flooding depends on access to facilities and equipment. The new maintenance facility would remain functional during large flood events, making equipment more readily available to respond to park and local resident needs. Similar to current emergency response procedures, during an emergency event, equipment located at the new maintenance or fire facility may be staged in designated areas throughout the valley to maintain access.

The relocation of the maintenance area would result in increased productivity because all maintenance facilities would be in a consolidated area. The consolidation of facilities would allow NPS employees to access necessary equipment in a more timely fashion and coordinate and collaborate in a more efficient manner. Increased productivity may also occur as a result of improved working conditions and operating out of modern, sustainably designed facilities. A properly designed and constructed maintenance facility would result in decreased operational costs (at least \$71,600 annually) due to savings in snow removal, maintenance, and utility costs. The more energy efficient design of the new structures would reduce long-term energy consumption and reduce utility costs. Better functional design would reduce maintenance costs over the long term (e.g. steeper roof pitches would avoid snow shoveling). A standardized heating system for the new maintenance facility would reduce the cost of maintaining several different heating systems within the existing maintenance facility.

Consolidation of fire management operations would also allow for improved logistical coordination, particularly when NPS staff is engaged with large fires. The new 3,300-square-foot fire facility would provide improved working conditions for fire crews during fire season, in addition to the new fire dorm that would house 10 staff (compared to the Hilton, which currently only houses 4). The new fire cache is centrally located in the valley and is expected to reduce emergency response times. The location of the new fire cache adjacent to the airstrip would provide an added logistical benefit because the airstrip is used as a staging area/heliport during fire events. The new helipad and designated space for parking helicopters would also improve overall access from the air during fire events. Alternative 2 would also separate the maintenance functions from the fire facilities. This layout would provide a benefit to park operations during fire events or fuel treatment operations, when 20 to 100 people are on-site. The separation of the fire and maintenance facilities would minimize operational conflicts during these events.

The relocated maintenance area would be designed to meet a LEED rating of silver or greater and would include associated utility systems, including new solar power generation. As construction of the new maintenance buildings occur, the existing maintenance facilities would be dismantled and their sites restored. Some facilities in good condition could be relocated and repurposed for new uses, benefiting overall park operations.

Construction of a new transfer station, including recycling and potential composting facilities, would minimize the solid waste stream and employ contemporary environmental methods for handling solid waste. Rather than trash being compacted in cardboard boxes, trash at the new facility would be compacted in a stationary compaction unit with a roll-off compaction container. Compacted trash

would be transported using a roll-off trailer rather than manually stacking cardboard boxes on pallets and transporting via boom truck to the barge. The improved facility design/equipment and overall improvements in operational efficiency are expected to reduce the number of labor hours required to process waste. The new transfer station would also be staffed by only WG-05 (Maintenance Worker) employees, reducing labor costs associated with operating the facility. Changes to the solid waste processing fee structure, including collections and billing, would be the same as Alternative 1. Potential increases in illegal dumping of trash due to fee implementation would also be similar to Alternative 1. Overall, the changes and improvements associated with waste management operations are considered a beneficial impact to park operations.

Construction traffic and noise could cause potential disruptions to shuttle service and park operations, resulting in short-term adverse impacts. Also, park staffing would need to be increased in the short term to adequately implement and oversee construction of the project. The implementation of minimization measures during construction as detailed in section 2.5.8, such as coordinating construction work to minimize disruption to park activities, would reduce the intensity of impact from moderate to minor adverse.

#### ***Cumulative Impacts***

Beneficial impacts of other infrastructure improvement projects throughout the valley would be the same as Alternative 1. However, Alternative 2 would provide a variety of additional beneficial cumulative impacts on park management and operations. Construction of the new maintenance area and new staff housing would result in improved working conditions for staff in the Stehekin District. Alternative 2 would also result in beneficial impacts from increased productivity and efficiency associated with relocation of the maintenance facility, improved logistical coordination and operation of the fire facility, and changes and improvements associated with the new solid waste facility. As a result, Alternative 2 would have beneficial cumulative impacts.

#### ***Conclusion***

Alternative 2 would have beneficial impacts to park operations due to relocation of the maintenance facility, fire facility, staff housing, and solid waste transfer station, with short-term minor adverse impacts due to construction. Minor adverse impacts associated with implementation of new fee collection, billing, and enforcement activities for waste management services would be the same as Alternative 1. Alternative 2 would have beneficial cumulative impacts to park operations.

### **3.2.8.6 Alternative 3**

#### ***Analysis***

Impacts to park operations associated with Alternative 3 would be the same as Alternative 2, with only minor differences. The location of the housing site near the maintenance facility on Company Creek Road would comply with the GMP to relocate staff housing to the north end of the airstrip.

#### ***Cumulative Impacts***

Cumulative impacts of Alternative 3 would be the same as Alternative 2. Beneficial cumulative impacts to park operations would be slightly greater with Alternative 3 due to compliance with the GMP.

#### ***Conclusion***

Alternative 3 would have beneficial impacts to park operations due to relocation of the maintenance facility, fire facility, staff housing, and solid waste transfer station, with short-term minor adverse impacts due to construction. Minor adverse impacts associated with implementation of new fee collection, billing, and enforcement activities for waste management services would be the same as Alternative 1. Alternative 3 would have beneficial cumulative impacts to park operations.

### **3.2.8.7 Alternative 4**

The impact analysis, cumulative impact discussion and conclusion for Alternative 4 are the same as Alternative 2, with one exception. The fire facilities are combined with the maintenance facility. This

may result in operational conflicts during fire events or fuel treatment operations, when 20 to 100 people are on-site.

### **3.2.9 SOCIOECONOMICS**

#### **3.2.9.1 Affected Environment**

The Lower Stehekin Valley is located at the head of Lake Chelan in Chelan County, Washington. Land ownership in the Lower Stehekin Valley includes a patchwork of public land managed by the NPS as part of the Lake Chelan NRA, and approximately 460 acres of private lands referred to as the community of Stehekin (NPS 2012a). The Stehekin community is an unincorporated settlement of year-round and summer homes, and scattered tourism-related businesses. The community was founded in the late 1800s, and some of the residents who live there today are descendants of the original homesteaders to the area.

##### ***Demographics***

Stehekin has a resident population of approximately 60-90 people. This population increases by approximately 80 people during the summer. For purposes of quantitative analysis in this EA, a year-round population of 75 people is assumed. Combined with 80 additional persons during the summer season, the population of Stehekin is estimated at 155. Disregarding seasonal increases in population, the year-round community has grown by an annual 0.2% on average since 2000. Chelan County projects that the entire Stehekin Census County Division (CCD) — which includes Holden Village and has a population of 154 as of 2010 — will grow by an additional 75 residents by 2030.

There are 191 housing units in Stehekin, approximately 23 of which are owned and operated by the NPS (NPS 2012a). An additional 11 units are used by an NPS concessioner, the Stehekin Landing Resort. Stehekin's vacancy rate is high, at 77%. That means that 23% of the housing units are lived in year-round, while 77% of Stehekin's housing units are vacant at some point during the year. Most of these vacant units are used for seasonal, recreational, or occasional homes (91.8% of vacant units); while a small portion (8.2%) are for rent or for sale, or are otherwise deemed vacant.

##### ***Economics***

Over the past 60 years, the community of Stehekin has shifted from a subsistence-based economy to a cash-based economy (NPS 2012a). Most resource extraction activities have been replaced by a seasonal tourism industry and visitor services, with most private and public businesses based on providing visitor services. As a result, the Stehekin economy is reliant on a transient, seasonal population. Many of the jobs in the valley are part-time, and some residents work several jobs.

NPS estimates that approximately 36 private for-profit and non-profit businesses are currently based in and/or operate out of Stehekin (NPS 2012a) (Table III-20 of the SCRIP Final EIS provides a complete list of business names and types). Of these, just over half (19) operate year-round, with the rest on a seasonal schedule (March–November or shorter). Most of these businesses are visitor service-oriented industries: approximately 10 provide lodging; 2 primarily serve food (non-lodging); 3 provide transportation; 6 provide recreation services; 2 are retail-based; and 2 are involved in the arts. In addition to visitor services, 10 businesses are related to construction (barge, welding, carpentry, etc.). Two of the 36 businesses are concessions for the NPS – the House that Jack Built and the North Cascades Lodge at Stehekin. Five other Stehekin businesses receive regular contracts from the NPS for services such as trash hauling, road maintenance, and emergency response. In the past, the NPS has also purchased services and supplies from other Stehekin businesses, such as local carpenters.

According to the U.S. Bureau of Economic Analysis (BEA), Chelan County's per capita personal income in 2012 was \$39,797, up from \$35,237 in 2009 (BEA 2014). According to the U.S. Census Bureau, the per capita income for the Stehekin CCD between 2008 and 2012 was \$27,882 (Census 2014). However, this estimate includes a sizeable margin of error (\$34,043).

### **Solid Waste Management**

An overview of waste collection activities in Stehekin is provided in section 1.2.2. The NPS operates a solid waste transfer facility and handles all of the solid waste, currently free of charge, for the Stehekin community. Operating this facility is in violation of 36 CFR Part 6, which says that the NPS should not handle solid waste from non-NPS activities, including private or commercial sources. As a result, the NPS is also unable to charge fees for waste collection/disposal.

Solid waste in the Stehekin area is generated by private residents, resident Park staff, and by a number of visitation-related facilities and activities (NPS 2012c). Solid waste quantities are tracked by NPS at the existing solid waste facility near the Stehekin airstrip. An estimated 6.35 pounds of waste is generated per visitor to the Lake Chelan NRA. This includes a 54% contribution from private residents and businesses. Subtracting this contribution leaves a reduced waste generation rate of 3.55 pounds per visitor, which is higher than average for parks with concessioner lodging and food service facilities. This high generation rate is attributed to the high percentage of NPS staff and other staff in residences, and to a relatively high contribution from concessioner facilities and long-term visitation.

In 2010, NPS, Stehekin businesses, and residents generated 984 cubic yards of garbage, recycled materials, and construction and demolition debris (NPS 2012a). Since there is no landfill in the valley, the NPS paid to have the material hauled out of the valley and barged down Lake Chelan via a local contractor. The fee for solid waste service varies greatly based upon service type, location, transportation distance, and landfill tipping fees. In 2010, the NPS spent \$106,000 on handling, shipping, and disposal of solid waste generated in Stehekin, \$57,000 of which went to a local contractor for transportation and disposal. The remaining \$49,000 in costs constitutes NPS labor, supplies, equipment, utilities, and disposal of hazardous waste. Based upon these costs and the estimated quantity of materials disposed and materials recycled, the total cost for solid waste management within the Lake Chelan NRA is \$108 per cubic yard (NPS 2012c). Stehekin's remote location and limited accessibility largely contribute to the high cost of solid waste management, which requires adding processing and transportation costs on top of the tipping fee charged by the Chelan County transfer station. The NPS is also the only trash transfer/disposal service available for the Stehekin area.

NPS tracked solid waste by generator type in 2010, including NPS, Stehekin Lodge and Resort (NPS concession), Stehekin Valley Ranch, Stehekin Pastry Company, other private businesses, and private residential generators. These generators produced 296,277 pounds (148.1 tons) of municipal solid waste (MSW) in 2010. An estimate of total costs for handling, processing, transportation, and disposal of MSW for each generator based upon the estimated annual volume of trash is provided in Table 9 (NPS 2012c).

**TABLE 9: SOLID WASTE COST ESTIMATES PER GENERATOR**

Generator	Total 2010 Trash* Volume (tons)	Percent of Total Trash Volume	Cost (\$/year, in FY 2010)
NPS	25.4	19.7%	\$18,198.53
Stehekin Lodge and Resort	28.5	22.1%	\$20,415.61
Stehekin Valley Ranch	14.9	11.6%	\$10,715.89
Stehekin Pastry Company	15.3	11.9%	\$10,993.02
Other Businesses	0.1	0.1%	\$92.38
Private Residents (155)	44.6	34.6%	\$31,962.90
<b>Total</b>	<b>128.8</b>	<b>100.0%</b>	<b>\$92,378.32</b>

\*Trash = MSW Disposed

Source: NPS 2012c

As previously noted, all solid waste management costs are currently being incurred by NPS; there is no charge to generators for solid waste management services.



### 3.2.9.2 Guiding Regulations and Policies

#### Director's Order 35B (Cost Recovery for NPS Produced Utilities)

As stated in section 1.3.2.1, Director's Order 35B provides policies and procedures for recovering costs associated with providing utility services to non-NPS users. The accompanying Reference Manual (*Reference Manual – 35B, Reference Manual for the Cost Recovery for National Park Service Provided Utilities*) provides specific guidance on determining a rate structure for recovering utility costs. Per the Reference Manual, the rate structure must be as equitable as possible to all users. Parks must also submit justification for the preferred rate structure and receive the Regional Director's approval.

### 3.2.9.3 Impact Thresholds

This socioeconomic analysis focuses on the current and reasonably foreseeable socioeconomic effects that would result from the social and economic changes that may be caused by the proposed actions.

**Context of Impact:** Socioeconomic impacts were considered primarily within the community of Stehekin (local), and when relevant, within Chelan County, Washington (regional).

**Type of Impact:** Beneficial impacts would improve the local or regional economy (such as increased income or job opportunities). Adverse impacts would include economic impacts (such as increase in costs).

#### **Intensity of Impact:**

- **Negligible:** Changes in socioeconomic indicators in Stehekin or Chelan County would not be measurable.
- **Minor:** Changes in the socioeconomic indicators would affect some individuals or businesses but would not be readily apparent within the larger population of Stehekin or Chelan County.
- **Moderate:** Changes in the socioeconomic indicators would be measurable but not overtly apparent in Stehekin and/or Chelan County. No new economic sectors would be created or eliminated and no major shifts would occur in the socioeconomic indicators due to the proposed actions.
- **Major:** Changes in the socioeconomic indicators would occur and would be readily apparent in Stehekin and/or Chelan County. New economic sectors could be created or eliminated. There would be major shifts in Stehekin population demographics and housing. Major community assets (services or facilities) would be added or removed.

### 3.2.9.4 Alternative 1 (No Action)

#### **Analysis**

Under the No Action Alternative, a new fee structure would be implemented at the existing solid waste facility to cover the cost of providing waste management services. Based upon the fee structure described in section 2.3.1.1, estimated annual costs per generator in Stehekin are provided in Table 10. Since the new fee structure is largely weight-based, the greatest costs would be incurred by those that produce the greatest amount of waste.

The volume of solid waste being produced within the valley and the cost associated with managing that waste has been somewhat consistent over the last few years. However, both factors are expected to change dramatically once the new fee structure is implemented because of the monetary incentive to divert waste from the landfill (i.e., reduce, reuse, or recycle). As such, the estimated fees identified in Table 10 are conceptual based upon current tonnage and costs, but are expected to change (and likely decrease) once a more stable equilibrium has been reached. Furthermore, the NPS expects to use a phased implementation approach for cost recovery. Under phased implementation, non-NPS users would experience no more than a 10% rate increase per year, starting from a baseline rate implemented during the initial year of cost recovery. Utility rates would be reviewed and updated annually to reflect a 10% increase until full cost recovery is achieved.

**TABLE 10: SOLID WASTE FEE ESTIMATES PER GENERATOR (NO ACTION)**

Generator	Percent of Total 2010 Trash <sup>1</sup> Volume	Estimated Total 2013 Trash <sup>1</sup> Volume (tons)	Estimated Annual Fixed Fee <sup>2</sup> (\$/year in FY 2014)	Estimated Total Annual Fee <sup>3</sup> (\$/year in FY 2014)	Estimated Total Monthly Fee <sup>4</sup> (\$/month in FY 2014)
NPS	19.7%	20.4	\$3,643	\$20,237	\$1,686
Stehekin Lodge and Resort	22.1%	22.9	\$4,086	\$22,702	\$1,892
Stehekin Valley Ranch	11.6%	12.0	\$2,145	\$11,916	\$993
Stehekin Pastry Co.	11.9%	12.3	\$2,200	\$12,224	\$1,019
Other Businesses	0.1%	0.1	\$18	\$103	\$9
Private Residents <sup>5</sup>	34.6%	35.8	\$9,367	\$43,007	\$3,584
<b>Total</b>	<b>100.0%</b>	<b>103.4</b>	<b>\$18,490</b>	<b>\$102,725</b>	

1. Trash = MSW disposed.

2. The distribution of fixed fee has not yet been determined. The fee shown here is representative only and is based upon the percent of 2010 trash volume by generator multiplied by the total cost of recycling in FY 2013 (\$18,490).

3. Total O&M costs multiplied by percent of total 2010 trash volume; Estimated Total Annual Fee includes Estimated Annual Fixed Fee.

4. Estimated Total Monthly Fee includes Monthly Fixed Fee and assumes a 12-month operating season.

5. Private Residents includes all 155 seasonal and year-round residents of Stehekin. Estimated fees are for the total population and would be distributed on a per-person or per-household basis in accordance with designated user groups.

Source: NPS 2014d.

The Stehekin Lodge and Resort (NPS concession), Stehekin Valley Ranch, Stehekin Pastry Company, and other businesses could incur total combined annual fees of nearly \$50,000 (Table 10), depending upon the amount of solid waste generated. These fees constitute additional operating costs that would reduce profit margins, resulting in an adverse financial impact. The high fees being passed on to these businesses are reflective of the volume of trash being generated by each business and the high cost of providing solid waste management services to the Stehekin community. The resulting economic impact on each business cannot be quantified at this time because it will largely depend on individual profit margins, the ability for each business to absorb the additional cost, and individual efforts to reduce fees by diverting waste or increasing recycling activities. Due to the high level of variability associated with each business's finances and potential changes in behaviors, the new fees would result in a minor to moderate adverse impact on Stehekin businesses. Per the recommended mitigation listed in section 2.5.9, the NPS could coordinate with Stehekin businesses to increase waste diversion and recycling activities in an effort to reduce fees. This could reduce the intensity of economic impact to minor adverse.

The estimated combined or total annual fee for private residents is \$43,007. This would be distributed amongst Stehekin's 75 year-round and 80 seasonal residents. The fee distribution has not yet been determined by the NPS. However, if the fee is evenly distributed based upon the number of months each resident is physically in Stehekin, and it is assumed that seasonal residents are in Stehekin four months per year (resulting in 1,220 total person-months), the monthly fee per resident would be approximately \$35.25 per month. This amount includes the combined or total fixed fee for all private residents, estimated at \$9,367 per year. The fixed fee component equates to approximately \$7.68 per person per month. The total annual fee for year-round residents would be approximately \$515, representing 2% of the per capita income of \$27,882. The total annual fee for seasonal residents would be approximately \$172. These estimated annual fees represent full cost recovery, which is not anticipated for many years given a reduced initial rate and annual rate increase capped at 10%. This reduction in discretionary income is considered a minor adverse impact on local residents.

The new fee structure would cover all costs of operating and maintaining the existing solid waste facility. The cost recovery is considered a beneficial impact for the NPS, which would have a stable revenue stream to fund its trash and recycling operations.

### **Cumulative Impacts**

The projects identified in section 3.1.3.3 for consideration in the cumulative impact analysis have limited ability to affect the socioeconomic environment in Stehekin. The Chelan PUD Power Plant, Stehekin Winter Ferry Landing Improvement, and Upper Company Creek Road Erosion Minimization projects have already been completed, and implementation of the NPS Flood Protection Measures and relocation of the NPS hazardous materials trailer would not change any of the socioeconomic indicators in Stehekin or Chelan County. Construction of the remaining improvements on Stehekin Valley Road could provide local economic benefits by increasing employment and income during the construction period. Therefore, cumulative socioeconomic impacts primarily consist of the impacts associated with implementing the new fee structure for solid waste management in Stehekin. Economic impacts on Stehekin businesses would be a minor to moderate adverse impact, and the reduction in discretionary income for local residents is considered a minor adverse impact.

### **Conclusion**

The new fees associated with Alternative 1 would result in a minor to moderate adverse impact on Stehekin businesses. Incorporation of mitigation to reduce waste fees for individual businesses could lessen the intensity of this impact. The reduction in discretionary income for local residents is a minor adverse impact. Cumulative impacts on Stehekin businesses and residents would be minor to moderate adverse. Cost recovery for solid waste services provided by the NPS is a beneficial impact.

#### **3.2.9.5 Alternative 2 (Preferred)**

##### **Analysis**

In compliance with Director's Order 35B, the new solid waste facility would charge fees to generators to cover the cost of providing the service. Based upon the new fee structure described in section 2.4.2.1, estimated annual costs per generator are estimated to be 21% higher than the costs provided in Table 10. In accordance with phased implementation guidelines associated with Director's Order 35B, however, any annual rate increase is capped at 10% per year, resulting in a phased rate increase over multiple years. Since the new fee structure would be the same as proposed for the No Action Alternative, the potential economic impacts to businesses and individuals are similar to Alternative 1. Notable differences in economic impacts are identified below.

Under Alternative 2, fees for all generators would be 21% higher than the fees estimated under Alternative 1 (Table 10). This would result in moderate adverse impacts on Stehekin businesses and minor adverse impacts on local residents.

Construction activities could provide local and regional economic benefits by increasing employment and income during the two-year construction period. The cost to construct the proposed facilities is estimated at roughly \$20 million, a portion of which could be directed towards local Stehekin businesses or residents. The ten Stehekin businesses that provide construction services (barge, welding, carpentry, etc.) would directly benefit from construction of the proposed facilities. Per the minimization measure identified in section 2.5.9, the use of local labor would be encouraged by NPS in the project contract documents (ajc 2014a). All building supplies and non-resident construction workers would arrive through Stehekin. Non-resident construction workers would require housing and other accommodations, which could increase revenues for the 10 lodging, 2 food service, 2 retail, and 3 transportation businesses in the valley. All supplies, heavy equipment, and construction waste must be brought to and removed from Stehekin on the barge operated by Stehekin Maintenance & Machinery. The increased volume of construction materials and waste to be transported would be an economic benefit to this business. The potential increases in the construction workforce and revenues for local businesses generated from construction activities and workers would result in beneficial economic impacts.

Residents, construction workers, and visitors to Stehekin would experience temporary adverse impacts from noise and dust due to construction activities. Supplies must be trucked up four and a half miles of paved and improved dirt roads to the maintenance facility site. The hauling of materials, demolition, grading activities, and the presence of construction equipment would generate noise, dust, particulate

matter, and other pollutants during construction activities. The most constant noise source would be the internal combustion engines used in construction equipment. Private properties adjacent to the maintenance facility site and housing sites are likely to experience the greatest increases in dust and noise. These impacts would be minimized by complying with existing laws that restrict the emission of dust and odors during construction and through the use of standard BMPs as identified in section 2.5.9. Upon implementation of these minimization measures, impacts to valley businesses and residents during construction would be negligible.

Alternative 2 would demolish one single-family house and construct one single-family house for purposes of NPS staff housing. This would have no measurable impact on the Stehekin housing stock or vacancy rates. Impacts to housing in Stehekin are considered negligible.

One added benefit to the local population in Stehekin is that the timber removed from the project would be used either as milled lumber for use by NPS or as firewood for the locals. This is considered a beneficial impact for the Stehekin community.

### ***Cumulative Impacts***

Similar to Alternative 1, cumulative socioeconomic impacts primarily consist of the impacts associated with implementing the new fee structure for solid waste management in Stehekin. Economic impacts on Stehekin businesses would be a moderate adverse impact and the reduction in discretionary income for local residents is considered a minor adverse impact. Alternative 2 would result in greater beneficial cumulative impacts than Alternative 1 due to increased employment and income during construction of the new facilities and the Stehekin Valley Road Improvements.

### ***Conclusion***

The new fees associated with Alternative 2 would result in moderate adverse impact on Stehekin businesses. Incorporation of mitigation to reduce waste fees for individual businesses could lessen the intensity of this impact. The reduction in discretionary income for local residents is a minor adverse impact. Cost recovery for solid waste services provided by the NPS is a beneficial impact. Construction activities would provide local and regional economic benefits by increasing employment and income. Cumulative impacts would be minor adverse.

#### **3.2.9.6 Alternative 3**

The impact analysis, cumulative impact discussion, and conclusion for Alternative 3 are the same as Alternative 2 above.

#### **3.2.9.7 Alternative 4**

The impact analysis, cumulative impact discussion, and conclusion for Alternative 4 are the same as Alternative 2 above.

## **CHAPTER 4. CONSULTATION AND COORDINATION**

### **4.1 PUBLIC INVOLVEMENT**

#### **4.1.1 PRIOR ENVIRONMENTAL DOCUMENTS**

The proposed action was first vetted to the public through the 1995 GMP for the Lake Chelan NRA, which specifically stated that “some NPS and concession seasonal housing, maintenance, and related facilities would be consolidated beside the airstrip...” (NPS 1995). Public review of the Draft GMP was conducted between August and November of 1994. Impacts of the proposed action on various elements of the environment were evaluated only in a very general sense in the GMP.

More recently, the relocation of housing and maintenance facilities was evaluated in the Draft and Final EIS for the SRCIP (NPS 2012) as some of the actions common to all alternatives. Generally speaking, each resource topic analyzed in the EIS included a section specifically addressing impacts from replacement and relocation of the maintenance facility and housing replacement. Extensive public involvement activities were conducted for the SRCIP starting in January through March of 2008 with initial public scoping; continuing with a second round of public scoping in summer of 2008; an extended 150-day public review period on the Draft EIS, which included interviews to local media and briefings to local public officials, during which more than 870 comment letters were received from agencies and members of the public; and finally a 30-day public review period on the Final EIS in 2012.

#### **4.1.2 CURRENT ENVIRONMENTAL ASSESSMENT**

Public scoping for this EA occurred in June and July of 2013 and consisted of three open house public meetings in Stehekin, Wenatchee, and Seattle. A complete summary of the public scoping process is provided in section 1.4. Public meetings presenting the results of the EA process will be held in Stehekin on November 17, Wenatchee on November 18, and Seattle on November 19, 2014. Public comments on the EA will be accepted until the close of the comment period on December 7, 2014.

### **4.2 AGENCY CONSULTATION AND COORDINATION**

#### **4.2.1 DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION**

NPS initiated Section 106 consultation with the Department of Archeology and Historic Preservation (DAHP) during public scoping for the EA in May 2013. DAHP responded on June 10, 2014, concurring with the proposed Area of Potential Effect (APE) and survey approach. A cultural resources survey was prepared by NPS staff in April 2014. DAHP concurred with the NPS Determination of No Historic Properties Affected on July 22, 2014.

#### **4.2.2 USFWS**

The USFWS was consulted for potential impacts to listed species that are documented to occur in the lower Stehekin Valley via email correspondence on August 20, 2014. Consultation will be ongoing through the EA review process. The EA will be used in lieu of a Biological Assessment to conduct informal consultation under Section 7 of the ESA.

#### **4.2.3 WSDOT AVIATION**

As indicated in section 3.2.6.1, WSDOT Aviation Division operates the Stehekin Airstrip under a special-use permit from the NPS. The airstrip is adjacent to the proposed maintenance facility site. During alternatives development, NPS consulted with the WSDOT airport manager to ensure that the appropriate WSDOT and Federal Aviation Administration requirements and setbacks were considered during site design. The airport manager was contacted during public scoping for the EA in May of 2013 and will be sent a copy of this EA during the public review period. The NPS planning team will continue to work with the WSDOT airport manager throughout the final design process.

#### 4.2.4 TRIBES

Letters summarizing the proposed project as well as the proposed cultural APE and proposed survey methodology were sent to the Confederated Tribes and Bands of the Yakama Nation, the Colville Confederated Tribes, and the Sauk-Suiattle Tribe. The Colville Tribe responded on May 14, 2014, agreeing with the proposed survey approach and APE. No further communication has been received.

### 4.3 REQUIRED PERMITS AND APPROVALS

The following permits and approvals are anticipated to be required for the proposed action:

- Consultation with USFWS (Section 7 of the ESA)

The USFWS was consulted for potential impacts to listed species that are documented to occur in the lower Stehekin Valley via email correspondence on August 20, 2014. Consultation will be ongoing through the EA review process. The EA will be used in lieu of a Biological Assessment to conduct informal consultation under Section 7 of the ESA.

- Consultation with DAHP (Section 106 of the NHPA)

DAHP concurred with the APE and proposed archeology survey approach via letter on June 10, 2014. DAHP concurred with the NPS Determination of No Historic Properties Affected via letter on July 22, 2014.

- Section 401 NPDES

Since project construction would involve more than one acre, NPS will need to seek a NPDES permit from Ecology (as the federal representative of EPA) to ensure compliance with Section 401 of the Clean Water Act.

### 4.4 LIST OF RECIPIENTS

This EA was distributed to the recipients identified in Table 11.

**TABLE 11: RECIPIENTS OF THE EA**

Local Governments	Other
Chelan County Commissioners	American Whitewater
Chelan County PUD	Backcountry Horsemen of Washington
City of Chelan	Campbell's Resort
State of Washington	Cascade Guiding Services LLC
Department of Archaeology and Historic Preservation	Chelan Seaplanes
Department of Commerce	Conservation Northwest
Department of Ecology	Defenders of Wildlife
Department of Fish and Wildlife	Earth Justice Legal Defense Fund
Department of Transportation, Aviation Division	Methow Conservancy
Parks and Recreation Commission	National Parks Conservation Association
Federal Agencies	North Cascades Conservation Council
Federal Emergency Management Agency	North Central Audubon Society
National Marine Fisheries Service	Pacific Crest Trail Association
National Park Service, Golden West Visitor Center	Ross Lake Resort
U.S. Army Corps of Engineers, Seattle District	Sierra Club – Cascades Chapter
U.S. Department of Agriculture, Forest Service, Chelan Ranger District	Stehekin Landing Resort
U.S. Environmental Protection Agency, Region 10	The Mountaineers
U.S. Fish and Wildlife Service	The Nature Conservancy of WA
Tribes	The Wilderness Society
Colville Confederated Tribes	Trout Unlimited
Confederated Tribes and Bands of the Yakama Nation	WA Kayak Club



Newspapers	Other (continued)
Bellingham Herald	WA Trails Association
Methow Valley News	WA Recreational River Runners
Seattle Times	Washington's National Park Fund
Skagit Valley Herald	Wild Fish Conservancy
The Wenatchee World	
Whatcom Independent	
Libraries	
East Wenatchee Library	
Seattle Public Library	

## 4.5 LIST OF PREPARERS AND CONTRIBUTORS

The individuals listed in Table 12 were the principal contributors to the preparation of this EA.

**TABLE 12: PRINCIPAL PREPARERS AND CONTRIBUTORS TO EA**

PREPARER	Firm / Agency	Contribution	Education
Maggie Buckley, LEED AP	David Evans and Associates, Inc. (DEA)	EA Manager/Primary Author, Socioeconomics	MPA Environmental Policy B.S., Economics, Environmental Studies
Gray Rand, PWS	DEA	EA Assistant Manager/Primary Author, Wildlife, Special Status Species, Vegetation and Wetlands	Post-Baccalaureate, Environmental Science B.S., Biology
Karen Comings, PE	DEA	Floodplains, Soils and Surficial Landforms, Public Health and Safety	M.S.C.E. Environmental Engineering B.S., Civil Engineering
Mara Krinke	DEA	Park Operations, Visitor Use and Experience, QA/QC	B.A., Botany, Economics M.A. Public Affairs
Sara Gilbert, GISP	DEA	GIS Mapping/Analysis	M.S., Earth Sciences/GIS B.S., Geography
Pat Mattson	DEA	QA/QC and Document Production	N/A

CONTRIBUTOR	Firm / Agency	Title
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