National Park Service
U.S. Department of the Interior

Olympic National Park
Washington

Temporary Off-road Access for Geotechnical Investigation Environmental Assessment

July 2018

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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Acronyms

APE	Area of Potential Effect
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GMP	General Management Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
PEPC	Planning, Environment and Public Comment
USFWS	United States Fish and Wildlife Service

How to Comment on this Environmental Assessment

This environmental assessment (EA) is being made available to the public, federal, state, and local agencies and organizations through press releases distributed to a wide variety of news media, direct mailing, and placement on park websites.

The document may be obtained from the Planning, Environment and Public Comment (PEPC) website for Olympic National Park: http://parkplanning.nps.gov/olym

Comments can be submitted online through PEPC or in-person at the public meeting scheduled for August 15, 2018, from 5:00pm to 6:30pm, at the Elwha Klallam Heritage Center Eagles Nest conference room in Port Angeles, Washington.

Written comments can also be hand-delivered or mailed to the following location:

Olympic National Park
Attn: Superintendent Sarah Creachbaum
Temporary Off-road Access for Geotechnical Investigation/EA
600 East Park Avenue
Port Angeles, Washington 98362

Comments submitted by phone or email will not be accepted. Comments submitted by individuals or organizations on behalf of other individuals or organizations also will not be accepted.

Note to Reviewers: Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask the National Park Service (NPS) in your comment to withhold your personal identifying information from public review, the NPS cannot guarantee that it will be able to do so.

Responses to substantive comments on the EA will be addressed in the proposed Finding of No Significant Impact (FONSI) or will be used to prepare an Environmental Impact Statement (EIS) (if warranted).

Chapter 1: Purpose and Need for Action

Background

Since the recent removal of the Glines Canyon Dam, the Elwha River within Olympic National Park ("the park") has been in a state of flux as it adapts, restoring sediment transport and the delivery of large wood to the channel. During fall, winter, and spring storm events and melt-off, the river has been reactivating the historic floodplain and damaging the Olympic Hot Springs Road. The road damage has led to repeated closures and extensive repairs. The National Park Service, in cooperation with the Federal Highway Administration (FHWA), needs to conduct a geotechnical investigation to collect information on the subsurface conditions of an area being considered for a potential road relocation.

Purpose of and Need for Taking Action

The park's purpose in taking action is to assess subsurface conditions of a potential relocation route for the Olympic Hot Springs Road. This action would determine the engineering feasibility of relocating a portion of the road outside of the floodplain. The analysis of a potential road relocation would occur in a subsequent EA that would address long-term planning for the Olympic Hot Springs Road.

Decision to be Made

This EA, which evaluates impacts of the proposed project on the human environment, will be used to help the NPS Pacific West Regional Director, based on a recommendation from the Superintendent of Olympic National Park, make a decision about whether to conduct the geotechnical survey work in the Elwha Valley. The decision would be documented in the proposed FONSI for this EA. The EA may be used by the Federal Highway Administration, as a cooperating agency, to possibly prepare a National Environmental Policy Act (NEPA) decision document supporting their prospective decision to conduct geotechnical survey work.

Should the EA reveal significant impacts on park resources from the exploratory work, an Environmental Impact Statement and Record of Decision would be prepared.

Figure 1. Olympic National Park and the geotechnical survey area vicinity map.

Chapter 2: Alternatives

The alternatives were developed by National Park Service and Federal Highway Administration staff based on collaborative interdisciplinary analysis derived from the expertise of planning team members. Internal and external scoping with the Lower Elwha Klallam Tribe, and other city, county, state, and federal agencies, interested organizations and individuals also contributed to the development of the alternatives.

Alternative A (No Action)

Under the no action alternative, a geotechnical investigation would not be conducted and the subsequent environmental assessment would not analyze the potential relocation of the Olympic Hot Springs Road.

Alternative B (Preferred)

Under alternative B, a geotechnical investigation would be conducted within the potential road relocation area. The geotechnical investigation would include approximately 22 off-road test borings and the excavation of two test pits. The work would be conducted outside of designated wilderness on a forested bench east of the Olympic Hot Springs Road. Monitoring instruments would be installed at the test boring sites to collect data on subsurface conditions. The data would be used to determine the engineering feasibility of relocating an approximately one-mile section of the Olympic Hot Springs Road out of the floodplain. The geotechnical drilling operation would occur over approximately one to three months. Monitoring of subsurface conditions would occur for about one year and may continue beyond the completion and implementation of the subsequent EA that will address long-term planning of the Olympic Hot Springs Road. It is expected that in less than one year the monitoring data would indicate the feasibility of a potential road relocation, however, long-term monitoring could be continued in order to help inform design details for potential alternatives in the subsequent EA

The drilling equipment and support vehicles may be transported across the Olympic Hot Springs Road washouts using the existing temporary bridges. After the temporary bridges are removed in fall 2018, helicopters would be used to transport equipment such as a drill rig, excavator, pick-up truck, water truck, and trailer across the road washouts. A Type 1 helicopter (i.e., SkyCrane) would likely be used to transport large equipment and a Type 2 helicopter (i.e., K-MAX) would be used for smaller transport. Helicopter staging areas would include the Elwha maintenance yard, Sweets Field, the former amphitheater parking area, the Elwha Historic District, and the road corridor between Sweets Field and the Elwha Historic District. Equipment would not be transported over pedestrians, structures, vehicles, or sensitive resources. Approximately twenty roundtrip flights would be required to transport equipment to and from the staging areas over about six days. All flights would occur outside of designated wilderness.

Off-road Access Path

Access to the test boring sites would require construction of a 6 to 10-foot wide, approximately 4,800-foot long path on the forested bench east of the Olympic Hot Springs Road. The path would start about 1,000 feet north of the Elwha Ranger Station and end about 800 feet north of the former Sanders Creek temporary bridge site. An approximately 300-foot long path may also be constructed on the north side of the former Sanders Creek temporary bridge site to gain access to the test boring sites. An excavator would be used to construct the approximately 4,800-foot and 300-foot (0.96 mile) access paths required to transport a drill rig and support vehicles to the boring sites.

A temporary embankment would be constructed adjacent to the water tank near the Elwha maintenance yard to widen the existing service road, allowing a drill rig to access the boring sites. Approximately 150 cubic yards of aggregate material would be used to construct the embankment. Upon completion of the geotechnical investigation, the temporary embankment would be removed.

Ground disturbance would be kept to the minimum footprint possible throughout the development of the access path. However, up to 1.2 acres of vegetation could be compressed to

develop the access paths. Compressed or crushed vegetation along the path would be left in place where practicable. Minor tree branch trimming would be required to construct the access paths and to raise the drilling tower at the test boring sites. Equipment used to develop the access path would track or skid around standing trees, when feasible, to minimize tree removal. Trees 11-inches in diameter or less within the access paths may be removed if they cannot be avoided. The contractor would avoid removing large trees (trees with a diameter greater than 11-inches), with the exception of up to six trees that do not have characteristics of a marbled murrelet or northern spotted owl nest tree and do not provide cover to nest trees.

Trees felled to construct the access path and drill pads would be left on site or used to transport equipment across drainages and water crossings. Steel plates, bridges, and downed logs may also be used to transport equipment over drainages, wetlands, and streams. The steel plates, bridges, or logs would be placed above the general flow of water at stream and wetland crossings. The steel plates would be removed after drilling operations are complete. Logs used to bridge crossings would be scattered following the completion of the geotechnical investigation to avoid potential erosion.

Off-road Geotechnical Investigation

Two six-foot deep test pits would be excavated and approximately 22 test borings would be drilled off-road to investigate subsurface conditions for a potential road relocation. Twelve initial borings would be drilled within the approximate areas identified in Figure 2. Ten additional test borings may be drilled if determined necessary to further investigate the subgrade surface in areas for potential infrastructure such as bridges, rock cuts, and walls. Test boring depths would range from a minimum of 20 feet to a maximum of 140 feet. Off-road drilling tools and methods are anticipated to include hollow-stem augers, casing advancer, and coring. A portable skid-mounted or track-mounted drill rig would be operated to conduct the test boring. A drill rig and support vehicles with low ground pressure (not to exceed 2.5 psi) would be used in areas with soft or wet ground. Areas inaccessible by an excavator would require skidding the drill rig in place. In areas accessible only through the use of a boom truck or crane, the drill rig would be lifted and placed onto the slope.

Equipment such as an 8.25-inch outer diameter hollow stem auger and a 4 or 5-inch outer diameter casing advancer system may be used to advance the holes through soil and rocky materials. Wireline coring systems with an approximately 4-inch outer diameter may be used when rock is encountered. Soil and rock samples would be taken, when possible, at regular depth intervals about every 2.5 to 5 feet. Soil samples would be collected using equipment such as a maximum 3-inch outer diameter split spoon sampler or 3-inch outer diameter Shelby tube sampler.

Well water from the Elwha developed area water system may be transported by truck to the test boring sites to advance the boreholes. An average of 1,200 gallons of water per boring would be used during the geotechnical drilling operation. Depending on the formation, the water would recirculate back up to the surface within the steel casing to be reused. If this is not feasible due to the type of formation, the water may dissipate through the rock fractures.

Vibrating wire piezometers and slope inclinometer casings would be installed at each test boring site to monitor and collect data including, but not limited to, slope stability and groundwater levels. Above ground metal casings, approximately 10 to 12 inches in diameter and up to about 3 feet above the ground, would be installed to protect the monitoring instruments.

The monitoring data may show, sooner than one year, whether or not a road relocation would be feasible. However, the instruments could be left in place for an indefinite period of time to provide long-term monitoring data as well as to inform the design of potential alternatives in a subsequent EA to facilitate long-term planning for the Olympic Hot Springs Road. Upon completion of the monitoring, the instruments and metal casings would be removed and the geotechnical borings would be backfilled. The test pits would also be backfilled after the drilling activities. Disturbed areas would be seeded with native plant species to help prevent establishment of invasive exotic plants from nearby areas.

Public Access

Olympic Hot Springs Road would continue to be open to foot and bicycle traffic. However, there may be multiple trail closures required for up to three days each during the one to three month timeframe in which drilling operations in the vicinity of the public access trail are being conducted. Areas surrounding the helicopter staging areas would not be closed unless the decision were made that staging activities could affect visitor safety. Temporary delays to foot and bicycle traffic may be required during helicopter operations.

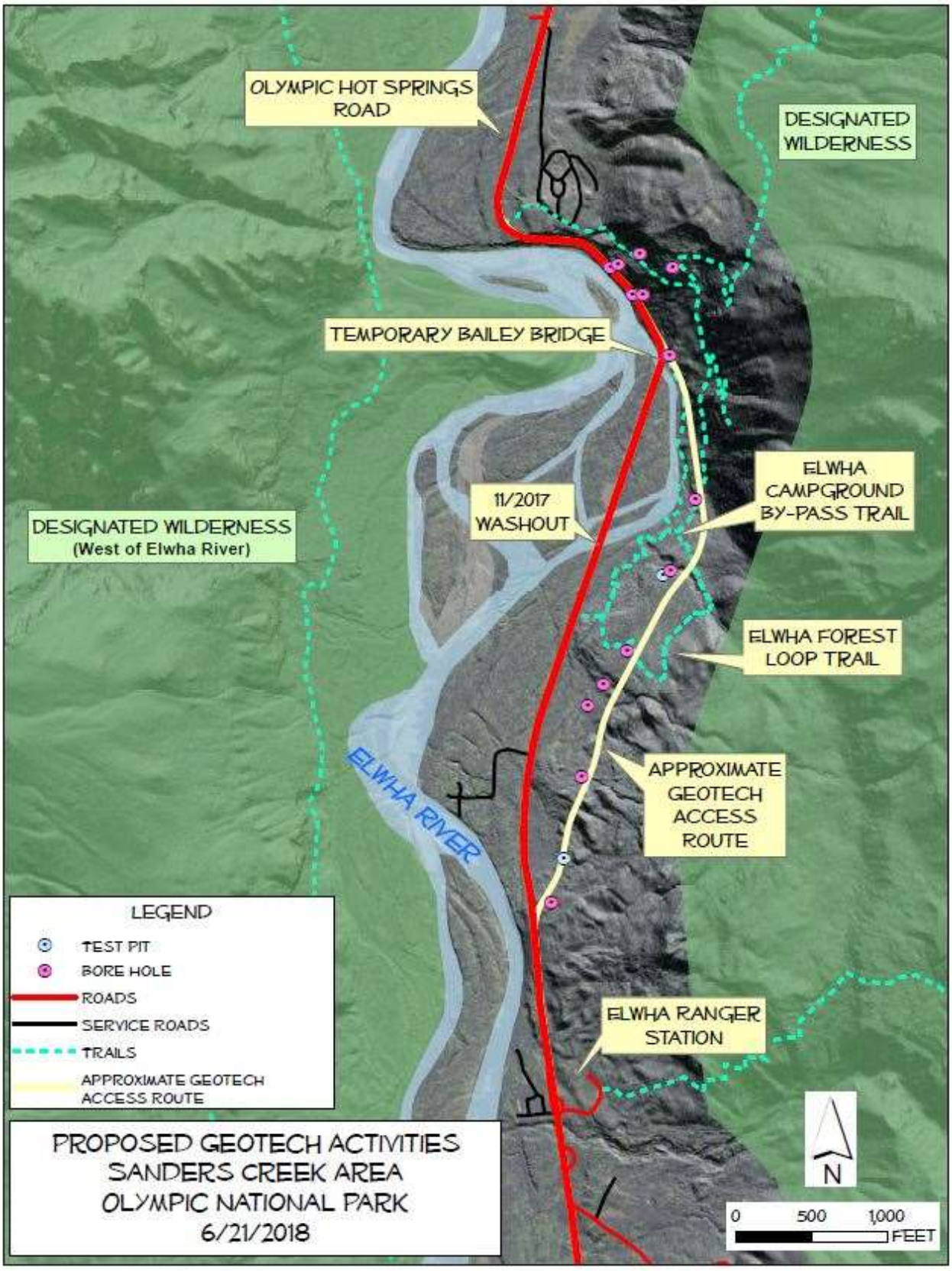

Figure 2. Approximate test boring and access path locations under alternative B.

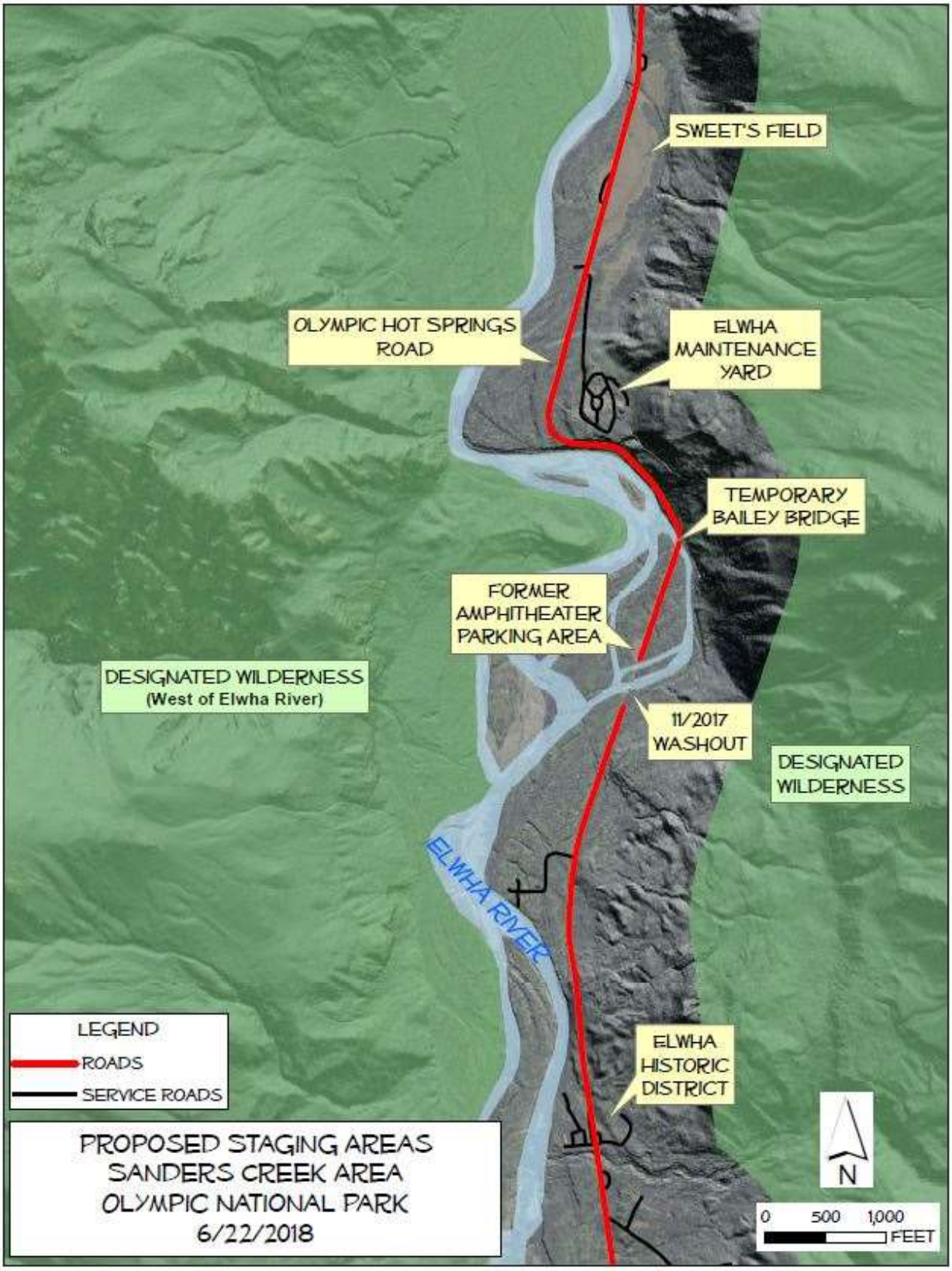

Figure 3. Staging areas under Alternative B.

Figure 4. Example of a path being developed to access test boring sites for a similar project (photo provided by FHWA).

Figure 5. Immediately post-project on the same geotechnical investigation study shown in Figure 4 (photo provided by FHWA).

Chapter 3: Affected Environment and Environmental Consequences

Information in this section is derived from a comprehensive review of existing information pertaining to the project area within the park. It includes information from the General Management Plan (NPS 2008), various natural and cultural resources management plans, and other park planning documents. Information in this section has been gained from management, research, and analysis throughout the history of Olympic National Park.

The following resource topics that may be affected by actions in this plan are included in this section: soils, vegetation, wetlands, wildlife, threatened and endangered species, cultural resources, soundscapes, and visitor use and experience. This chapter also describes the impacts, including cumulative impacts, of each alternative on Olympic National Park resources. Methods used for the analysis are presented below. To compare the differences in projected impacts among the alternatives, an *Impact Comparison Summary* (Table 1) is included.

Issues Considered and Dismissed from Further Consideration

Environmental Justice
Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,* requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not result in significant changes in the socioeconomic environment of the area, and therefore would have no direct or indirect impacts to minority or low-income populations or communities.

Indian Trust Resources
Secretarial Order 3175 requires that anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources at Olympic National Park, therefore this topic is dismissed from further analysis.

Methodology

The environmental consequences for each impact topic were defined based on the following information regarding context, type of impact, duration of impact, area of impact, and the cumulative context. Unless otherwise stated in the resource section under *Environmental Consequences*, analysis is based on a qualitative assessment of impacts.

Impacts are described in terms of context, type, and duration.

a. Context of Impact
The context is the setting within which impacts are analyzed – such as the project area or region, or for cultural resources – the area of potential effect (APE).

b. Type of Impact

The type of impact is a measure of whether the impact would improve or harm the resource and whether that harm would occur immediately or at some later point in time.

- **Beneficial:** Reduces or improves the impact(s) being discussed.
- **Adverse:** Increases or results in the impact(s) being discussed.
- **Direct:** Caused by and occurring at the same time and place as the action, including such impacts as animal and plant mortality, damage to cultural resources, etc.
- **Indirect:** Caused by the action, but occurring later in time at another place or to another resource, including changes in species composition, vegetation structure, range of wildlife, offsite erosion, or changes in general economic conditions tied to park activities.

c. Duration of Impact

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

- **Short-term:** Often quickly reversible and associated with a specific event, and lasting one to five years.
- **Long-term:** Reversible over a much longer period, or may occur continuously based on normal activity, or for more than five years.

d. Area of Impact

The area of impacts may be detectable in nearby or surrounding areas as defined below:

- **Localized:** Detectable only in the vicinity of the activity.
- **Widespread:** Detectable on a landscape or regional scale.

e. Impact Mitigation

Impacts may be reduced in the following ways. Projects can:

- **Avoid** conducting management activities in an area of the affected resource.
- **Minimize** the type, duration, or intensity of the impact to an affected resource.

Impacts may also be reduced by additional actions such as by:

- **Repairing** localized damage to the affected resource immediately after an adverse impact.
- **Rehabilitating** an affected resource with a combination of additional management activities.
- **Compensating** a major long-term adverse direct impact through additional strategies designed to improve an affected resource to the degree practicable.

f. Impact Analysis

Impacts on various resource topics are compared among alternatives by describing qualitative or quantitative differences. Threatened and endangered species and cultural resources impact determinations are formally determined under the Endangered Species Act (Section 7) and the National Historic Preservation Act (Section 106), respectively. In accordance with *Management Policies* (NPS 2006), the analysis in this EA fulfills the responsibilities of the NPS under Section 106 of the National Historic Preservation Act (NHPA).

Cumulative Impacts

The Council on Environmental Quality describes a cumulative impact as follows (Regulation 40 CFR 1508.7):

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

Cumulative actions are evaluated in conjunction with the impacts of an alternative (including existing conditions) to determine if they have additive effects on a particular resource. Because most of the cumulative projects are in the early planning stages, the evaluation of cumulative impacts was based on a general description of each project.

Past Projects

Elwha River Ecosystem and Fisheries Restoration Plan/EIS

The purpose of this project was to fully restore the Elwha River ecosystem and native anadromous fisheries through the removal of two hydroelectric dams and implementation of fisheries restoration and revegetation. Dam removal began in 2011, and the project was completed in 2014 with the removal of the Glines Canyon Dam (the Elwha Dam was removed in 2012). The Elwha River is free-flowing once again and access for migratory fish has been restored. The natural flow of sediment has also been reinstated and sand bars, estuary, and beaches at the river's mouth have been restored. While the project has had an overall beneficial effect on the Elwha River ecosystem, the sediments from Lake Mills have aggraded the channel downriver which, along with storm systems and spring run-off, has led to the river frequently overtopping the bank. The river has also elected to reoccupy a former channel. These changes in the river have led to floodplain inundation and road washouts.

Emergency action for bank stabilization at park entrance (2015) and road washout at Sanders Creek (2016)

A series of emergency actions were taken following flood events in 2015 and 2016 to stabilize the bank along the Olympic Hot Springs Road at Sanders Creek, Fisherman's Corner, and near the park boundary at the Madison Falls parking area. Emergency actions included the placement of rock ballast to protect the road bench from continued erosion.

Long-term bank stabilization at park entrance (2015) and road washout at Sanders Creek (2016)

Long-term repairs at these sites included the installation of woody debris structures and rock ballast, crushed gravel, and asphalt. Willow shoots and other native species were planted in areas of ground disturbance. The road washout at Sanders Creek in 2016 also included the installation of a temporary bridge and widening of the Sanders Creek channel to decrease the velocity and erosive force of future flood waters.

Decommissioning of the Altair and Elwha Campgrounds

The Altair Campground was decommissioned after winter flooding in 2014-2015 eroded the terrain, road, and campsites. The area was converted to a day use picnic area in 2016 due to the loss of terrain and ongoing flood frequency. In 2015, the Elwha Campground was inundated with silt from flooding of the Elwha River, including the restroom and associated septic tank. The picnic tables, CXT vault toilet, and fire rings were salvaged and moved to locations outside of the floodplain, the restroom was demolished, and the septic tank was removed. The Elwha Campground was closed indefinitely due to flood damage and the changing course of the Elwha River.

Continued Maintenance of Infrastructure

Past construction and continued maintenance of infrastructure in the vicinity includes, but is not limited to, roads, facilities, trails, parking areas, campgrounds and picnic areas. Routine road maintenance activities include, but are not limited to, pothole patching, repairing and replacing asphalt, sweeping the roadway, vegetation brushing, clearing culverts and ditches, and replacing drainage structures. Routine trail maintenance activities include, but are not limited to, brushing and removing fallen trees from the trail corridor; maintaining, repairing, and rebuilding damaged or deteriorated trail tread, trail bridges, drainage structures, stock fords, and other structural elements.

Sweets Field Temporary Corral

Storm damage in November 2017 washed out sections of the Olympic Hot Springs Road, leaving the park's primary stock facility inaccessible by vehicle. A temporary stock facility was constructed in Sweets Field for the park's approximately 30 head of stock. The temporary facility will support stock operations between April and October each year until a long-term solution for the Olympic Hot Springs Road has been determined and implemented.

Current Planning Projects

Subgrade Boring within Olympic Hot Springs Road

Approximately two test borings and 12 subgrade borings would be drilled within the Olympic Hot Springs Road prism between the Olympic National Park Elwha entrance station and the Boulder Creek Trailhead. The subsurface borings would provide information on the current pavement structure and condition of the roadway.

Olympic Hot Springs Road Temporary Administrative Vehicle Access

The park is proposing to install two temporary bridges across the most recent (November 2017) Olympic Hot Springs Road washouts. The purpose of the temporary administrative vehicle access would be to remove equipment and materials necessary for park operations and complete preservation maintenance on buildings in the Elwha Historic District. The temporary bridges, including the Mabey Bridge, would be removed in late summer 2018 to prevent damage to the bridges from future high flows.

Olympic Hot Springs Road Long-term Plan/EA

The intent of this project is to improve the condition of the Olympic Hot Springs Road, stabilizing the upper segment of the road, enabling the roadway to be able to withstand periodic

inundation, and to reduce maintenance needs of the roadway. Rehabilitation activities typically include, but are not limited to: subsurface improvements, new asphalt surfacing, fill slope stabilization, drainage improvements, guardrail improvements, and ditch cleaning. Additionally, this project may relocate or armor approximately one mile of roadway near Sanders Creek that has been increasingly damaged by floodwaters since the removal of the Glines Canyon Dam in 2014.

US Highway 101 Elwha River Bridge Reconstruction/EA
The existing Highway 101 Elwha River Bridge is past the end of its original design service life. Also, in September of 2016, it became apparent that the piers that support the existing bridge were being undermined due to changes in river conditions and the original piers were not built into bedrock. Emergency stabilization of the piers has been necessary, and ongoing bridge monitoring is being provided until long-term public safety needs can be ensured with a bridge replacement. Washington State Department of Transportation is currently developing an EA to analyze alternatives. Olympic National Park is a co-lead on this project.

Fire Management Plan/EA
An EA is being prepared to update the park's programmatic Fire Management Plan. The proposed action includes bringing the plan into conformance with NPS wildland fire policy directives and standards set forth in Director's Order-18, its companion guidance document, Reference Manual 18, and NPS *Management Policies 2006* addressing wildland fire management and resource protection.

Lake Mills Trail
This project would complete development of the trail into the former Lake Mills reservoir. The Lake Mills Trail project would complete the loop trail connecting to the West Lake Mills Trail at Boulder Creek, providing visitors with delineated trail access and reducing impacts to sensitive revegetation areas.

Sweets Field Helicopter Staging Area
Sweets Field is used as a helicopter staging area for projects including, but not limited to, waste management, rehabilitation of the Hayden Pass Trail burned area, and fire management operations. Sweets Field is also a potential staging area for the Mountain Goat Management Plan.

Proposed Implementation of Park Management Plans

Olympic National Park Final General Management Plan (GMP) and EIS (2008)
The GMP provides park managers with long-term direction for achieving the resource protection and visitor experience goals of Olympic National Park and establishes broad direction for managing Olympic Hot Springs Road. The proposed project is consistent with the GMP due to its intent to determine the feasibility of the potential to relocate the road so as to facilitate the retention of road access to the Boulder Creek Trailhead (NPS 2008: 95).

Analysis

Table 1. Impact Comparison Summary

Impact Topic	Alternative A – No Action	Alternative B – Proposed Geotechnical Investigation (Preferred Alternative)
Soils	There would be no new impacts to soils. Existing impacts from erosion and runoff would continue.	There would be direct and indirect, localized, short- and long-term adverse impacts to soil resources from the compaction, disturbance, and removal of soils. This alternative would contribute slightly to short- and long-term adverse cumulative impacts to soils within the Elwha Valley.
Vegetation	There would be no new impacts to vegetation. Existing adverse impacts from nonnative plants would continue.	There would be direct and indirect, localized, short- and long-term adverse impacts from the loss of and damage to native vegetation. Alternative B would contribute to short- and long-term cumulative impacts to vegetation resources.
Wetlands	There would be no new impacts to wetlands. Existing impacts to wetlands would continue from the restoration of the floodplain.	There would be direct, localized, short- and long-term adverse impacts from the compaction and disturbance to less than 0.1 acres of wetlands. Alternative B would contribute to short- and long-term cumulative impacts to wetland resources.
Wildlife	There would be no new impacts to wildlife or wildlife habitat. Existing impacts would continue, including noise from Sweets Field, Elwha maintenance yard, and public and administrative use on the existing roadway.	There would be direct, localized, short- and long-term adverse impacts to wildlife from vegetation removal, and noise and visual disturbance. This alternative would contribute slightly to the short- and long-term adverse cumulative effects to wildlife.

Impact Topic	Alternative A – No Action	Alternative B – Proposed Geotechnical Investigation (Preferred Alternative)
Threatened and Endangered Species	There would be no effect on federally listed species or designated critical habitat. Existing adverse and beneficial cumulative impacts would continue from actions including the removal of the dams, revegetation of native plants in the Elwha Valley, routine road and trail maintenance, and the use of helicopters during nesting season.	The proposed actions would occur outside of the April 1 through September 24 marbled murrelet nesting season. Minor habitat modifications *may affect, but are not likely to adversely affect* marbled murrelets. Minor habitat modifications and noise disturbance within potential dispersal or foraging habitat *may affect, but are not likely to adversely affect* northern spotted owls. There would be *no effect* on bull trout, Chinook salmon, or steelhead trout. There would be *no effect* on designated critical habitat for bull trout or steelhead trout.
Soundscapes	There would be no additional impacts on soundscapes. Noise from visitor and administrative use on the trails and Olympic Hot Springs Road would continue.	Direct, localized, short-term adverse impacts to soundscapes from the use of equipment such as helicopters, chainsaws, and drilling equipment. The proposed action would contribute slightly to the short-term adverse cumulative effects on soundscapes.
Visitor Use and Experience	There would be no additional impacts on visitor use and experience.	Direct, localized, short-term adverse impacts to visitor use and experience from temporary delays and short-term closures during helicopter and drilling operations. Potential indirect, localized, long-term beneficial impacts on visitor use and experience by determining the engineering feasibility of relocating a portion the road. This alternative would contribute slightly to the short- and long-term adverse and beneficial cumulative effects to visitor use and experience.

Soils

A soil survey specific to the proposed action area is not currently available. Information on soil types in the action area is based on the soil survey for Olympic National Forest (NRCS 2017) where soils have developed in a similar climate and landscape, and a Washington State Department of Natural Resources (WDNR 2005) geologic map. Using the existing data and geologic map, AECOM (2017) determined that bedrock within a 49-acre study area, including the proposed action area, "consists of basaltic rocks of the Crescent Formation exposed to glaciation. The base of the steeply folded bedrock contains mass-wasting and landslide deposits, some retaining primary bedding structure. The mass-wasting deposits join on their lower end with Holocene-age alluvium associated with the Elwha River floodplain."

In addition, AECOM (2017) identified three basic soil types based on their parent materials:

- Soils developed in glaciated basaltic bedrock are typically shallow or moderately deep to fractured hard bedrock. Soils are well-drained with predominantly upland vegetation. The surface soil is influenced by a volcanic ash cap (andic soil material) with low bulk density.
- Soils formed in mass-wasting deposits are highly variable as these deposits are known to contain unsorted boulders, gravel, sand, silt, and clay, and also retain primary bedding structure in places (WDNR 2005). Slope and depressional wetlands formed in these types of soils. Soil textures in the wetlands vary from muck and silty clay to very cobbly or gravely sandy loam.
- Soils formed in recent alluvium are also highly variable. In general, they are deep, somewhat poorly or poorly drained, and coarse textured.

Effects of Alternative A on Soils

Implementation of alternative A would result in no additional impacts to soils. Existing impacts from previous modifications to soils would continue, including erosion and runoff caused by existing infrastructure.

Cumulative Effects of Alternative A on Soils

Past, present, and reasonably foreseeable future actions, within and outside the park would continue to contribute short- and long-term adverse and beneficial impacts on soils. Soils have been permanently altered from past construction of roads, facilities, and trails in the project vicinity, and from ongoing visitor use. Long-term beneficial actions have occurred in recent years, such as the Elwha River restoration project and rehabilitation in previously disturbed areas. Previous road maintenance, emergency bank stabilization work, and the installation of the temporary Mabey Bridge continue to have long-term adverse impacts on soils. In addition, subgrade boring within the roadway would impact the road base and soils previously disturbed during the original road construction. There would be no additional impacts to soils from alternative A and it would not add to the overall adverse or beneficial cumulative effect on soils in the Elwha Valley.

Conclusion
No action would be taken under alternative A; therefore, there would be no additional impacts on soils. This alternative would not contribute to cumulative disturbance of soil resources when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Soils
Approximately 1.2 acres of soils within the two access paths would be impacted by the proposed action. There would be direct, localized, short- and long-term impacts to soils from the geotechnical drilling, off-road heavy equipment use, excavation and backfilling of test pits, and the development of the off-road access paths and temporary embankment. These actions would remove, cover, and compact soils. Topsoil would be altered and soils layers would be disturbed from drilling activities and excavating test pits. Vegetation would be left in place as much as possible to prevent or minimize erosion. Indirect impacts would include the compaction of soils due to a potential increase in human use of the newly constructed access path until the disturbed areas revegetate naturally.

Mitigation Measures
- Minimize soil disturbance to the greatest extent possible to reduce disturbance to native plants and minimize the potential for the introduction or spread of invasive non-native plant species.
- Minimize the removal of standing trees and leave compressed and crushed vegetation in place as much as possible to prevent or minimize soil erosion.
- Implement erosion control best management practices.

Cumulative Effects of Alternative B on Soils
The cumulative effects to soil resources are similar to those described in alternative A. Past, present, and reasonably foreseeable actions have had and continue to have long-term, adverse and beneficial effects on soils. Soils in the vicinity of the project area have been permanently altered from past construction of roads, facilities, and trails in the project vicinity, and from ongoing visitor use. The proposed action would impact approximately 1.2 acres of soil resources, which would contribute a small increment to the overall adverse cumulative effects on soils in the Elwha Valley.

Conclusion
Implementation of alternative B would result in direct and indirect, localized, short- and long-term adverse impacts to soil resources from the use of heavy equipment to develop the access paths and conduct drilling activities. Impacts to soils would occur predominantly outside of the existing road prism in areas that have not been affected by road construction, maintenance, or repair. Alternative B would contribute a small increment to the overall long-term, adverse, cumulative impacts on soils.

Vegetation

Vegetation in the project area consists mainly of riparian and upland mature forests. Upland areas are dominated by mature and old-growth coniferous forest. Common trees include Douglas-fir (*Pseudotsuga menziesii),* grand fir *(Abies grandis),* western hemlock *(Tsuga*

heterophylla), western redcedar (*Thuja plicata)*, Sitka spruce (*Picea sitchensis*), and bigleaf maple (*Acer macrophyllum*) (AECOM 2017). The understory vegetation is typically sword fern (*Polystichum munitum*), and herbaceous species such as vanilla leaf (*Achlys triphylla*), pathfinder (*Adenocaulon bicolor*), wild ginger (*Asarum caudatum*), three-leaf foamflower (*Tiarella trifoliata*), enchanter's-nightshade (*Circaea alpina*), and oak fern (*Gymnocarpium disjunctum*) (AECOM 2017). Low Oregongrape (*Mahonia nervosa*), salal (*Gaultheria shallon*), bald-hip rose (*Rosa gymnocarpa*), oceanspray (*Holodiscus discolor*), osoberry (*Oemleria cerasiformis*), western serviceberry (*Amelanchier alnifolia*), and trailing blackberry (*Rubus ursinus*) are common understory shrubs.

Upland and riparian forests primarily consist of bigleaf maple and red alder (*Alnus rubra*) (AECOM 2017). Understory vegetation in these areas includes vine maple (*Acer circinatum*), salmonberry (*Rubus spectabilis*), common snowberry (*Symphoricarpos albus*), thimbleberry (*Rubus parviflorus*), and spreading gooseberry (*Ribes divaricatum*). The herbaceous layer is comprised of lady fern (*Athyrium filix-femina*), giant horsetail (*Equisetum telmateia*), stinging nettle (*Urtica dioica*), piggyback plant (*Tolmiea menziesii*), Arctic sweet-coltsfoot (*Petasites frigidus*), and coastal hedge-nettle (*Stachys chamissonis*) (AECOM 2017).

Based on information provided by the USFWS, there are no federally listed, proposed, or candidate plant species likely to occur within the project area. No rare plants were identified during the wetland and stream delineation, however, Washington Natural Heritage Program's Rare Plants and High Quality Ecosystem Dataset indicate that branching montia *(Montia diffusa)* overlaps with the study area and tall bugbane (*Cimicifuga elata)* has the potential to occur in the project area (WNHP 2017).

Effects of Alternative A on Vegetation

No action would be taken in this alternative; therefore there would be no direct or indirect impacts to vegetation. Short- and long-term adverse impacts would continue from the loss of vegetation caused by bank erosion as the hydrology of the Elwha River changes, and routine trail and road maintenance activities continue.

Cumulative Effects of Alternative A on Vegetation

Impacts to vegetation within and near Olympic National Park includes past and present development, maintenance projects, routine trail maintenance, and visitor use. The Elwha River native plant restoration project and the revegetation of disturbed areas in the Elwha Valley continue to have long-term beneficial impacts on vegetation. There would be no additional impacts to vegetation from alternative A and it would not incrementally add to the overall adverse cumulative effects on vegetation in the Elwha Valley.

Conclusion

There would be no direct or indirect impacts to vegetation because no action would be taken in this alternative. Therefore, alternative A would have no contribution to the cumulative effects on vegetation when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Vegetation

The off-road access paths would be designed to minimize impacts to vegetation and avoid tree removal where practicable. However, approximately 1.2 acres of vegetation would be compressed, disturbed, trimmed, and removed to develop the off-road access path and conduct the geotechnical drilling. Operating heavy equipment and support vehicles on the path would break, crush, and abrade small trees, shrubs, forbs, and mosses. In addition, the placement of logs or steel plates to bridge water crossings and drainages would compress, crush, and remove understory vegetation.

The proposed action would result in direct and indirect, localized, short- and long-term adverse impacts to vegetation from the construction of the access path, geotechnical boring, and monitoring activities. Trees 11-inches in diameter or less may be removed to develop the access paths if they cannot be avoided. The contractor would avoid removing large trees (trees with a diameter greater than 11-inches), with the exception of up to six large trees. Although all efforts would be made to avoid or minimize impacts to trees, tree removal would result in long-term adverse impacts on vegetation. Stumps within the paths made to accommodate the drilling equipment may be visible for decades. However, areas with ground disturbance are anticipated to revegetate within approximately five years following the geotechnical investigation. Indirect impacts would include trampling of vegetation caused by a potential increase in human use of the newly constructed path until the disturbed areas revegetate naturally.

Mitigation Measures

- The contractor, National Park Service staff, and Federal Highway Administration staff would survey the approach to the respective drilling sites and determine an off-road route that minimizes the removal of vegetation.
- A track-mounted drill rig would be used where practicable. This type of drill rig is designed to exert low surface pressure to minimize impacts to ground vegetation.
- Equipment used at the site would be pressure cleaned and free of weeds, seed, debris, and mud to prevent the introduction and/or spread of exotic, invasive plants.
- Branches would be cut close and parallel to the tree trunk, while preserving the "collar" ring of tissue that defines the junction of branch and trunk when trimming branches to avoid opportunities for pathogens to invade and to encourage healing.
- All tools, boots, clothes and monitoring instruments would be cleaned to ensure that no exotic plant species are transported to the site.
- Any fill used would be from the local area and free of exotic seed sources.
- Native vegetation would be salvaged from areas that would be disturbed to be replanted after the geotechnical investigation is complete. Additional disturbed areas would be re-seeded with native plant seeds collected from the middle Elwha river valley.

Cumulative Effects of Alternative B on Vegetation

The cumulative effects to vegetation would be similar to those described in alternative A. Past, present, and reasonably foreseeable actions have had and continue to have long-term, adverse and beneficial effects on vegetation. The proposed action would contribute a small increment to the cumulative adverse effects from the damage and loss of native vegetation.

Conclusion
Implementation of alternative B would result in direct and indirect, localized, short- and long-term adverse impacts to vegetation from modification and loss on the access paths and at the boring sites. Alternative B, in combination with the impacts of other past, present, and reasonably foreseeable actions, would contribute a small increment to the short- and long-term, adverse cumulative effects on vegetation.

Wetlands

A wetland delineation was conducted in 2017 over approximately 49-acres between about 1,000 feet north of the Elwha Ranger Station and about 800 feet north of the Sanders Creek temporary bridge. Less than 0.1 acres of wetlands were identified within the geotechnical investigation project area. Wetland vegetation within the 49-acre study area consists of scrub-shrub, emergent, and to a lesser extent, forested wetlands. Scrub-shrub wetland vegetation predominately consists of salmonberry and vine maple, along with herbaceous species including giant horsetail, lady fern, piggyback plant, water parsley (*Oenanthe sarmentosa*), stinging nettle, Siberian springbeauty (*Claytonia sibirica*), and tall mannagrass (*Glyceria elata*) (AECOM 2017). Emergent wetland vegetation includes American brooklime (*Veronica americana*), tall mannagrass, skunk cabbage (*Lysichiton americanus*), Arctic sweet-coltsfoot, yellow monkeyflower (*Mimulus guttatus*), creeping buttercup (*Ranunculus repens*), coastal hedge-nettle, big-leaf sedge (*Carex amplifolia*), short-scale sedge (*Carex leptopoda*), piggyback plant, and water parsley (AECOM 2017). Forested wetlands are dominated by bigleaf maple and red alder, with similar understory species as the scrub-shrub wetlands (AECOM 2017).

Effects of Alternative A on Wetlands
No action would be taken in this alternative; therefore there would be no direct or indirect impacts to wetlands. Long-term beneficial impacts would continue as the natural processes of the Elwha River are restored. In addition, long- and short-term adverse impacts from continued road and trail maintenance would also continue.

Cumulative Effects of Alternative A on Wetlands
Impacts to wetlands within and near Olympic National Park includes past and present development, and routine road and trail maintenance. The removal of the Glines Canyon Dam continues to have long-term beneficial impacts on wetlands by restoring natural processes of the Elwha River. There would be no additional impacts to wetlands from alternative A and it would not incrementally add to the cumulative effects on wetlands in the Elwha Valley.

Conclusion
There would be no direct or indirect impacts to wetlands because no action would be taken in this alternative. Therefore, alternative A would have no contribution to the cumulative effects on wetlands when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Wetlands
Geotechnical drilling would not occur within wetlands and wetland resources would be avoided to the maximum extent possible during the development of the off-road access paths. However, there is a potential for direct, localized, short- and long-term adverse impacts from the

compaction, removal, and disturbance of wetland soils and vegetation from the use of off-road equipment within the access paths. There could also be potential short- and long-term adverse impacts to wetlands from unanticipated equipment leaks (e.g., oil, hydraulic fluid). In addition, off-road equipment would temporarily disturb invertebrate habitat. Mitigation measures would be implemented to reduce the potential for adverse impacts on wetlands. It is anticipated that less than 0.1 acres of wetland resources within the project area could be impacted, therefore a Wetlands Statement of Finding is not required.

Mitigation Measures

- The contractor, National Park Service staff, and Federal Highway Administration staff would survey the approach to the respective drilling sites and determine an off-road route that minimizes impacts to wetland resources.
- A track-mounted drill rig would be used where practicable. This type of drill rig is designed to exert low surface pressure to minimize impacts to wetland resources.
- Fill would not be placed within wetlands.

Cumulative Effects of Alternative B on Wetlands

The cumulative effects to wetlands would be similar to those described in alternative A. Past, present, and reasonably foreseeable actions have had and continue to have long-term, adverse and beneficial effects on wetlands. The proposed action would contribute a small increment to the cumulative adverse effects from the damage to and loss of wetland resources.

Conclusion

Implementation of alternative B would result in direct, localized, short- and long-term adverse impacts on wetlands from the potential loss of and damage to less than 0.1 acres of wetlands. Alternative B, in combination with the impacts of other past, present, and reasonably foreseeable actions, would contribute a small increment to the short- and long-term, adverse cumulative effects on wetlands.

Wildlife

Wildlife species are abundant throughout the low-lying riparian or wetland habitat and upland habitats within the Elwha River watershed. Small mammal species common to the project area include Douglas squirrels (*Tamiasciurus douglasii*), Townsend chipmunks (*Tamias townsendii*), deer mouse (*Peromyscus maniculatus*), Pacific jumping mice (*Zapus trinotatus*), shrew-mole (*Neurotrichus gibbsii*), bushy-tailed wood rats (*Neotoma cinerea*), mountain beavers (*Aplodontia rufa*), and the snowshoe hare (*Lepus americanus*). Mammalian predators include black bear (*Ursus americanus*), coyote (*Canis latrans*), mink (*Mustela vison*), short-tailed weasel (*Mustela erminea olympica*), and cougar (*Puma concolor)*. The area also supports Columbian black-tailed deer (*Odocoileus hemionus columbianus*), Roosevelt elk (*Cervus elaphus roosevelti*), beaver (*Castor Canadensis*), and river otter (*Lutra Canadensis*). Several species of bats are associated with forests in the area. Songbirds and raptors common to the area include bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), pileated woodpecker (*Dryocopus pileatus*), great blue heron (*Ardea herodias*), American robin (*Turdus migratorius*), song sparrow (*Melospiza melodia*), black-capped chickadee (*Poecile atricapillus*), varied thrush (*Ixoreus naevius*), and northern flicker (*Colaptes auratus*). Seasonally ponded areas provide habitat for

amphibian species such as the northern red-legged frog (*Rana aurora*) and Pacific tree frog (*Pseudacris regilla*).

Wildlife species with special protected status that inhabit the project area are discussed in the "Threatened and Endangered Species" section.

Effects of Alternative A on Wildlife
No action would be taken in this alternative; therefore there would be no direct or indirect impacts to wildlife.

Cumulative Effects of Alternative A on Wildlife
The projects listed under the cumulative effects section have had and continue to have short- and long-term adverse and beneficial impacts on wildlife. The removal of Glines Canyon Dam and native plant revegetation contribute long-term beneficial impacts to wildlife and their habitat. Maintenance projects, minor construction projects, and previous road repairs in the frontcountry areas have caused short-term, localized adverse impacts on wildlife populations from noise and visual disturbance. In addition, trails and roads within and adjacent to Olympic National Park can fragment habitat, and their use can cause the temporary displacement of individuals. Alternative A would not add to the overall adverse or beneficial cumulative effect on wildlife.

Conclusion
There would be no additional impacts to wildlife species or their habitat because no action would be taken under alternative A. There would be no contribution to cumulative effects on wildlife when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Wildlife
Wildlife within and adjacent to the project area would be impacted by short-term noise and visual disturbance from increased human presence and the use of equipment causing elevated noise levels. Noise disturbance from the use of helicopters, drilling equipment, support vehicles, excavator, and chainsaws, would adversely impact wildlife. Wildlife in the vicinity would likely disperse during drilling activities, but would be expected to return at night and following the drilling, installation of monitoring equipment, and backfilling bore holes and test pits. Excavation and drilling activities could result in the disturbance or loss of invertebrates unable to quickly move away from the site.

The removal of understory vegetation and trees along the access path would result in short- and long-term adverse impacts to wildlife habitat. There would be a range of habitat modification and localized loss of foraging and cover caused by vegetation removal to construct the access paths and conduct the boring.

Mitigation Measures
- The degree of wildlife habitat (vegetation) removal would be minimized by delineating construction limits.
- Activities would occur outside of the nesting and denning season of most species.
- Spill-prevention measures would be used to prevent inadvertent spills of fuel, oil, hydraulic fluid, antifreeze, and other toxic chemicals that could affect wildlife.

- Construction personnel at work sites would be discouraged from providing a source of human food to wildlife, thereby avoiding habituation of wildlife and reducing human/wildlife conflicts.

Cumulative Effects of Alternative B on Wildlife
The cumulative effects on wildlife would be similar to those described under alternative A. Actions within the park and in adjacent ownership on the Olympic Peninsula have had and continue to result in short- and long-term adverse and beneficial impacts on wildlife. When the impacts from past, present, and reasonably foreseeable future actions are considered in combination with alternative B, the proposed actions would contribute a small increment from short- and long-term adverse impacts caused by the loss of habitat and noise and visual disturbance to wildlife.

Conclusion
Alternative B would result in direct, localized, short- and long-term adverse effects on wildlife from vegetation removal, and noise and visual disturbance caused by geotechnical drilling activities, use of helicopters, and the development of the access paths. Contributions to cumulative impacts on wildlife would be short- and long-term and adverse when considered with other past, present, and reasonably foreseeable future actions.

Threatened or Endangered Species

A separate letter requesting informal consultation with the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act (ESA), has been completed by Olympic National Park. Analysis in the letter and below has been made according to the following ESA definitions for impacts on federally listed species (USFWS 2017):

<u>No Effect</u>
This conclusion is reached if the proposed action and its interrelated and interdependent actions will not directly or indirectly affect listed species or destroy/adversely modify designated critical habitat. Formal section 7 consultation is not required when the *no effect* conclusion is reached.

<u>May Affect, Not Likely to Adversely Affect</u>
This conclusion is appropriate when effects to the species or critical habitat are expected to be beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact (and should never reach the scale where take occurs), while discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. If the project scientist making the determination and the project manager agree that the project "*is not likely to adversely affect*" listed species or critical habitat, the intra-service section 7 consultation process is completed.

<u>May Affect, Likely to Adversely Affect</u>
This conclusion is reached if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and

the effect is not discountable or insignificant. In the event the overall effect of the proposed action is beneficial to the listed species or critical habitat, but may also cause some adverse effect on individuals of the listed species or segments of the critical habitat, then the determination should be "*is likely to adversely affect*." Such a determination requires formal section 7 consultation.

Federally listed threatened or endangered species that are potentially located within or immediately adjacent to the project area include marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis*), bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha),* and steelhead trout (*Oncorhynchus mykiss*). The Elwha River within the proposed action area is designated critical habitat for federally threatened bull trout and steelhead.

Evaluated Species

Northern Spotted Owl

The northern spotted owl is listed as threatened under the ESA and endangered in the State of Washington. The current distribution and range of the spotted owl extends along the coast from southern California to southern British Columbia. Northern spotted owls generally require large areas of land containing semi-continuous expanses of old-growth forest to meet their biological needs for nesting, roosting, foraging, and dispersal. Nesting and roosting habitat typically includes a multilayered, multispecies, moderate to high closure canopy with large trees. For the purposes of this analysis, northern spotted owl breeding season in Washington is broken into two periods: early breeding season is March 1 through July 15, and late breeding season is July 16 through September 30.

No critical habitat for northern spotted owls has been formally designated within Olympic National Park, although much of the park contains high quality habitat that is considered important for the recovery of the species. Critical habitat was not designated because habitat in the park does not require special management consideration or protection by virtue of its national park status. The interior of the Olympic National Park has approximately 494,000 acres of forested areas considered potential northern spotted owl habitat. This represents the largest continuous block of suitable nesting habitat remaining within the listed range of northern spotted owls. The most comprehensive inventory and survey, over 72,600 acres or about 10% of the forested acreage in the park, were performed from February 1992 through September 1995. These surveys determined northern spotted owls are seldom found above 3,000 feet elevation on the west side of the park or above 4,000 feet elevation on the east side of the park.

Northern spotted owl monitoring data collected since the early 1990s has shown a steady decline in the proportion of sites with detections of spotted owls (Gremel 2017). Competition with the barred owl (*Strix varia*) appears to be the primary threat to conservation of northern spotted owls in protected areas (Gremel 2014; Dugger et al. 2016). The most recent spotted owl siting at the Madison Creek monitoring location was documented in the 1990s (Gremel pers. comm. 2018). Although structurally suitable habitat for the northern spotted owl is located in the vicinity of the action area, it is unlikely to be used for nesting or roosting by spotted owls due to competition

with barred owls. Nonetheless, the area includes potential habitat for northern spotted owls and may be used for foraging and dispersal.

Marbled Murrelet

The marbled murrelet is listed as threatened, both federally and at the state level in Washington. Marbled murrelets inhabit the Pacific Coast of North America from the Bering Sea to central California. In contrast to other seabirds, murrelets do not form dense colonies, and may fly 50 or more miles inland to nest, generally in older coniferous forests with a high canopy closure. Marbled murrelets are more commonly found inland during the summer breeding season, but fly to the ocean to forage. Murrelet detections inland begin in the spring and peak in midsummer before decreasing rapidly after midsummer, presumably because they are undergoing a flightless molt at sea (USFWS 1997).

Olympic National Park contains the largest contiguous block of suitable nesting habitat remaining within the listed range of marbled murrelet in the lower 48 states with approximately 453,000 acres of forest considered suitable nesting habitat. The park is located in two marbled murrelet recovery zones: Puget Sound (Zone 1) and Western Washington Coast Range (Zone 2) with the line between the two zones bisecting the park from northwest to southwest (NPS 2008). Marbled murrelet nesting season in Washington is from April 1 through September 23.

No critical habitat has been formally designated within Olympic National Park for marbled murrelets, although much of the park contains high quality habitat that is considered important for the recovery of the species. Critical habitat was not designated because habitat in the park does not require special management consideration or protection by virtue of its national park status. However, potential marbled murrelet habitat occurs within the action area and overlaps with potential habitat for northern spotted owls. Audio-visual surveys have found nesting marbled murrelets occupying stands up to approximately 3,800 feet on the east side of the Olympic Peninsula and up to about 3,500 feet on the west side (USFWS 2009). Reconnaissance-level surveys conducted in 1990 indicate that the Elwha Valley between Krause Bottom and the delta serves as a flight corridor between nesting stands and the marine environment along the upper reaches of the valley or tributaries, where an estimated 15 pairs of marbled murrelets bred during the 1990 season (NPS 1996). Currently, no research on the marbled murrelet is being conducted in Olympic National Park.

Bull Trout

Olympic National Park contains six bull trout core areas, including the Quinault, Queets, Hoh, Elwha, Dungeness, and Skokomish River basins. Bull trout inhabit the Elwha River from the river mouth upstream to the headwaters and in tributaries. Elwha bull trout exhibit fluvial and anadromous life history strategies and migrate upriver during summer months. The onset of bull trout spawning occurs in late September. Bull trout require colder water temperature than most salmonids and the cleanest stream substrates for spawning and rearing; they need complex habitats, including streams with riffles and deep pools, undercut banks and lots of large logs; and they also rely on river, lake, and ocean habitats that connect to headwater streams for annual spawning and feeding migrations. The onset of bull trout spawning typically coincides with stream temperatures dropping below 48 degrees during the fall.

The Elwha River has been designated as critical habitat for bull trout. A total of 71.45 miles, including the mainstem Elwha River and accessible tributaries, have been identified within the Elwha River critical habitat subunit.

Puget Sound Chinook

Chinook salmon are described by the season in which they enter their natal streams to spawn. Spring Chinook enter fresh water several months earlier than summer/fall Chinook. Adults require cool water and medium-size spawning gravel, usually laying eggs in a main channel of the river rather than its side channels or tributaries (NPS 2004). The ESA-listed Chinook salmon population in the Elwha River Basin is comprised of hatchery and naturally spawning components. Chinook salmon currently spawn in the Elwha River from near the river mouth to near the river's headwaters. The peak of spawning occurs in September each year and recent surveys revealed approximately 95% of Chinook redds in the mainstem river between the dam sites and 5% of redds in tributaries (McHenry et al. 2017).

No critical habitat has been designated or proposed for Puget Sound Chinook salmon in the project area. Critical habitat for Puget Sound Chinook salmon was defined prior to the dam removal project and the mainstem Elwha from the river mouth to the former Elwha Dam site was designated as critical habitat for Chinook. Although the Elwha River within the project area is not designated critical habitat for Chinook, it meets the essential features necessary to support one or more life stages of Puget Sound Chinook salmon.

Puget Sound Steelhead Trout

Puget Sound steelhead trout have two distinct life history strategies: winter-run migrations where steelhead spawn soon after entering freshwater and summer-run migrations where steelhead return to freshwater and typically spawn the following spring (NOAA 2013). Puget Sound winter-run and summer-run steelhead trout inhabit the Elwha River and the ESA-listed population is comprised of hatchery and naturally spawning components. Elwha winter steelhead typically spawn in the mainstem river and tributaries (currently documented up to rkm 27.5) from late March to June. Additionally, spawning recently has been observed in a number of tributaries, including Little, Indian, Hughes, Boulder Creek, Cat Creeks, and others. Summer-run steelhead were observed in both 2016 and 2017 in the upper Elwha River (to near rm 35). Spawn timing for these summer-run fish is unknown, but presumably occurs in the winter or early-spring, similar to other summer-run populations in Puget Sound.

The Elwha River, including the mainstem and accessible tributaries, is designated critical habitat for Puget Sound steelhead. Physical or biological features essential to the conservation of the species have been identified in the Elwha River. Essential features include sites necessary to support one or more life stages of the distinct population segment, such as spawning gravels, side channels, forage species, and water quantity and quality.

Effects of Alternative A on Threatened and Endangered Species

No action would occur under alternative A; therefore, there would be no additional impacts to threatened or endangered species or designated critical habitat.

Cumulative Effects of Alternative A on Threatened and Endangered Species
The projects listed under the cumulative effects section have had and would continue to have adverse and beneficial impacts on threatened and endangered species. The removal of Glines Canyon Dam and Elwha Dam, and revegetation of native plants have contributed to the long-term beneficial impacts on terrestrial and aquatic special status species. Previous emergency and long-term road repairs on the Olympic Hot Springs Road have had adverse impacts to terrestrial ESA-listed species from noise disturbance, and adverse impacts to bull trout and critical habitat for bull trout due to increased turbidity and habitat modification. Ongoing maintenance of facilities, roads, and trails continue to contribute to long-term adverse impacts on northern spotted owl and marbled murrelets due to noise disturbance and human presence. Short- and long-term impacts include displacement, harassment, loss and fragmentation of habitat, and direct mortality. There would be no additional impacts to threatened and endangered species from alternative A and it would not add to the overall adverse or beneficial cumulative effect on threatened and endangered species.

Conclusion
There would be no additional direct or indirect effects on threatened and endangered species under alternative A. Therefore, this alternative would not contribute to cumulative impacts on threatened and endangered species when considered with other past, present, and reasonably foreseeable future actions.

Effects Determination Summary
Based on the analysis, Alternative A would have *no effect* on marbled murrelets and northern spotted owls. In addition, alternative A would have *no effect* on bull trout, Chinook salmon, and steelhead trout. There would be *no effect* on critical habitat for bull trout and steelhead trout.

Effects of Alternative B on Threatened and Endangered Species
Marbled Murrelet
Activities causing above ambient noise levels would occur outside of the April 1 through September 23 marbled murrelet nesting season; therefore the activities would not disrupt murrelet breeding or nesting behaviors. Based on the 2008 Biological Opinion for the Olympic National Park General Management Plan, the removal of understory vegetation, including shrubs and small trees (trees with a diameter of 11-inch or less), outside of marbled murrelet nesting season would result in insignificant effects to marbled murrelets (USFWS 2008).

Up to six large trees (trees with a diameter greater than 11-inches) that do not have the characteristics of nest trees and do not provide cover to nest trees would be removed outside of the murrelet nesting season. The six large trees would be removed within the approximately 4,800-foot long and 300-foot long access paths (a swath of approximately 1.2 acres). Trees would be removed only if the contractor is unable to track or skid around them. Olympic National Park wildlife biologists would assess the large trees to avoid the removal of potential nest trees or trees providing cover to nest trees. Although the proposed action could result in the loss of up to six large trees from within suitable murrelet nesting habitat, the activities pose a low risk to murrelet reproduction and nesting success because the trees would be removed after the murrelet nesting season and no potential nest trees would be removed. Therefore, no direct

effects to nesting marbled murrelets are anticipated. Therefore, the action *may affect*, but is *unlikely to adversely affect* marbled murrelets.

Northern Spotted Owl

The approximately six days of helicopter operations and one to three months of access path development and drilling operations may occur in late northern spotted owl nesting season after September 23. There is a potential that helicopter operations to remove the equipment would occur during early northern spotted owl nesting season (March). However, based on the NPS northern spotted owl monitoring data, the likelihood that a spotted owl pair would be nesting in close proximity to the action area is extremely low because the area is now inhabited by barred owls. There is, however, a potential for owls moving through their home range to be temporarily disturbed by the noise of equipment, such as helicopters, drilling equipment, and chainsaws.

The elevated noise levels may result in short-term visual and noise disturbance, and the temporary displacement of individual northern spotted owls. Although the noise and visual disturbance may cause flush responses, the owls would be moving away from the source of disturbance rather than forced to flush from an active nest site. Dispersed individuals would likely return to areas previously occupied once the geotechnical investigation is complete.

The removal of understory shrubs and small trees (11-inches in diameter or less) within suitable spotted owl habitat outside the early spotted owl nesting season would have insignificant effects on northern spotted owls (USFWS 2008). Up to six large trees (trees with a diameter greater than 11-inches) that are not potential nest trees and do not provide cover to nest trees, would be removed from the 1.2 acre access path outside of nesting season or late in the northern spotted owl nesting season. The removal of understory vegetation, small trees, and up to six individual large trees, would result in a minor habitat modification. Therefore, the proposed action is unlikely to measurably affect the behavior or success of dispersing northern spotted owls. Therefore, the action *may affect*, but is *unlikely to adversely affect* northern spotted owls.

Federally Listed Aquatic Species

There would be no in-water work and best management practices for erosion control would be implemented to prevent discharge of sediment overland or through tributaries into the Elwha River. Therefore, there would be *no effect* on bull trout, Chinook salmon, and steelhead trout.

Designated Critical Habitat

Compression and removal of approximately 1.2 acres of vegetation would not occur adjacent to the Elwha River and would not affect habitat functions of designated critical habitat such as shading and bank protection. No in-water work would occur and all mitigation measures would be implemented, including erosion control best management practices to prevent any discharge of sediment overland or through tributaries into the Elwha River. Therefore, there would be *no effect* on designated critical habitat for bull trout or steelhead.

Mitigation Measures

- No marbled murrelet or northern spotted owl nest trees (large, moss-covered conifer branches greater than or equal to 4" diameter located at least 33' above ground with cover

over the platforms), potential nest trees, or trees providing cover to potential nest trees would be damaged or removed.
- Construction equipment (i.e. muffler) would be properly maintained to minimize unintended noise.
- The contractor would maintain strict garbage control to prevent scavengers such as ravens and crows, which are predators on murrelet nests, from being attracted to the project area. No food scraps would be discarded or fed to wildlife.
- In-water work would be avoided.
- The contractor would be required to implement erosion control best management practices to prevent discharge of sediment overland or through tributaries into the Elwha River.
- Work would occur outside of the marbled murrelet nesting season.

Cumulative Effects of Alternative B on Threatened and Endangered Species
The cumulative effects on threatened and endangered species would be similar to those described for alternative A. Actions within the park and on adjacent land have had and continue to have short- and long-term adverse and beneficial impacts on special status species. When the impacts from past, present, and reasonably foreseeable future actions are considered in combination with alternative B, the proposed action would contribute slightly to the short-term and long-term adverse cumulative impacts on marbled murrelets and northern spotted owls due to minor habitat modifications.

Conclusion
There would be short-term adverse impacts to northern spotted owls and marbled murrelets due to noise from helicopters, heavy equipment, support vehicles, chainsaws, generator, drilling equipment, and the presence of humans. The removal of trees and understory vegetation within potential habitat would result in short- and long-term adverse impacts on marbled murrelets and northern spotted owls. There would be no in-water work and best management practices would be implemented to prevent sediment delivery to fish-bearing waterbodies; therefore there would be no impact to federally listed fish species or designated critical habitat. When the impacts from past, present, and reasonably foreseeable future actions are considered in combination with alternative B, the proposed actions would contribute a small increment to the long-term adverse impacts on federally listed terrestrial species.

Effects Determination Summary
Based on the analysis of alternative B, the proposed action *may affect,* but is *not likely to adversely affect* marbled murrelets and northern spotted owls. In addition, the proposed actions would have *no effect* on bull trout, Chinook salmon, and steelhead trout. There would be *no effect* on critical habitat for bull trout and steelhead trout.

Soundscapes

NPS *Management Policies 2006* (§4.9) require the National Park Service to preserve the natural soundscapes of the park. Natural soundscapes exist in the absence of human-caused sound. Natural sounds and natural quiet are important parts of the experience that visitors seek in Olympic National Park. Numerous sounds characterize the park — the impossibly elaborate song

of a winter wren, bugling bull elk declaring their dominance, the piercing whistle of an Olympic marmot, the soft silence of falling snow, and the haunting flute-like call of a varied thrush (NPS 2008: 174). Currently, no soundscape studies have been conducted in the Elwha Valley. Existing human-caused sounds within the project area include public foot and bicycle traffic, NPS management activities including the use of administrative vehicles and equipment, Sweets Field temporary stock corral, routine trail maintenance, and activities within the Elwha maintenance yard. Sweets Field is also used as a helicopter staging area for park operations such as wildland fire and waste management activities.

Wilderness Character and Soundscapes

While the project area is approximately 350-1,000 feet from the wilderness boundary and no project-related actions would take place within the adjacent wilderness area, there would be minimal effects on soundscapes and visitor use and experience within the wilderness area. Aside from the bypass trail, the Cascade Rock Trail is the only trail near the project area. It is an out and back trail that originates within the project area and traverses into the adjacent wilderness area. There is relatively low use on this trail and there are no campsites within this portion of the Daniel J. Evans Wilderness. Most visitors to the Elwha Valley spend the majority of their time at Madison Falls, on trails off of Whiskey Bend Road, at the Glines Canyon Spillway Overlook, or on trails that originate from the Boulder Creek Trailhead and parking area.

Effects of Alternative A on Soundscapes

No action would be taken under alternative A; therefore, there would be no additional impacts on soundscapes. There would also be no additional impacts to soundscapes within the adjacent wilderness. Existing adverse impacts on soundscapes from public use and management activities would continue.

Cumulative Effects of Alternative A on Soundscapes

Ongoing human use of the area, including from day-to-day park operations has had and continues to have an adverse effect on soundscapes. Cumulative effects on soundscape also includes the subsurface borings within the Olympic Hot Springs Road and commercial, private, and military flights. There would be no additional impact on soundscapes and this alternative would not add to the overall cumulative effect on soundscapes.

Conclusion

Alternative A would not result in additional impacts on soundscapes, therefore it would not contribute to cumulative disturbance of soundscapes when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Soundscapes

In addition to sounds from typical day-to-day use of the roadway, sounds above the typical range for the area would be expected to cause additional disturbance to the natural soundscape. The geotechnical investigation would result in adverse impacts on soundscapes from the use of helicopters, drilling equipment, excavator, support vehicles, chainsaws, and a generator. Noise disturbance from the geotechnical drilling would have minimal, short-term, adverse impacts on the natural, undeveloped, and opportunities for solitude qualities of wilderness character due to sound attenuation by the surrounding forest and due to the limited use of this trail.

The duration and level of noise generated during the geotechnical investigation would vary depending on the type of equipment and the nature of the work. In general, some of the loudest noises, such as helicopter and chainsaw use, would have the shortest duration, whereas actions such as the use of drilling equipment would occur throughout the duration of the boring operation. Helicopters would be used for approximately six days to transport equipment to and from the staging area south of the road washout, resulting in intermittent, short-term adverse impacts on soundscapes. The use of drilling equipment would occur over approximately one to three months. Alternative B would result in direct, localized, short-term adverse impacts on soundscapes from the use of equipment causing above ambient noise levels.

Mitigation Measures

- There would be no unattended motors/engines or idling of motors or engines for extended periods of time.
- Best management practices would be used to minimize noise disturbance to wildlife and visitors.
- The smallest, quietest helicopters suitable to efficiently and safely accomplish the tasks would be used.

Cumulative Effects of Alternative B on Soundscapes

Impacts on soundscapes from past, present, and reasonably foreseeable future actions under alternative B include administrative vehicle and equipment use on the Olympic Hot Springs Road, past and present road maintenance and repairs, helicopter operations in Sweets Field, and activities in the Elwha maintenance yard. Potential future actions impacting the soundscape includes the use of heavy equipment to remove temporary bridges along the Olympic Hot Springs Road. Cumulative effects on soundscape also includes the subsurface borings within the Olympic Hot Springs Road and commercial, private, and military flights. The proposed action does not include new long-term sources of noise and would not contribute cumulative effects on soundscapes.

Conclusion

Alternative B would result in direct, localized, short-term adverse effects on soundscapes during the proposed action. Contributions to any cumulative effects on soundscapes would be short-term and adverse when considered with other past, present, and reasonably foreseeable future actions.

Visitor Use and Experience

Prior to the most recent road washouts along the Olympic Hot Springs Road in November 2017, the road provided vehicle access to the Glines Canyon Spillway Overlook and multiple trailheads such as Whiskey Bend and the Olympic Hot Springs Trailhead. When the road was in full operation it also provided vehicle access to the former Elwha and Altair campgrounds. In addition, rafting companies would use the former dam powerhouse site as a put-in for Elwha River trips. Currently, the Olympic Hot Springs Road south of the Madison Falls parking lot is accessible to the public by foot, stock, and bicycle. The bypass trail provides access around the road washouts to the trailheads and Glines Canyon Spillway Overlook.

Wilderness Character and Visitor Use and Experience
While the project area is approximately 350-1,000 feet from the wilderness boundary and no project-related actions would take place within the adjacent wilderness area, there would be minimal effects on soundscapes and visitor use and experience within the wilderness area. Aside from the bypass trail, the Cascade Rock Trail is the only trail near the project area. It is an out and back trail that originates within the project area and traverses into the adjacent wilderness area. There is relatively low use on this trail and there are no campsites within this portion of the Daniel J. Evans Wilderness. Most visitors to the Elwha Valley spend the majority of their time at Madison Falls, on trails off of Whiskey Bend Road, at the Glines Canyon Spillway Overlook, or on trails that originate from the Boulder Creek Trailhead and parking area.

Effects of Alternative A on Visitor Use and Experience
The no action alternative may affect visitor use and experience because the feasibility of potential road relocation outside of the floodplain would not be determined. Providing for visitor enjoyment is one of the basic purposes of the Organic Act. However, the quality of visitor experience can be difficult to quantify. What one visitor perceives as a positive experience, another might find undesirable. Each visitor seeks their own unique experience. No action would be taken under alternative A; therefore, there would be no additional impacts to visitor use and experience within the adjacent wilderness.

Cumulative Effects of Alternative A on Visitor Use and Experience
The projects listed under the cumulative effects section have had and continue to have an adverse effect on visitor use and experience. Road washouts along the Olympic Hot Springs Road continue to impact visitor use and experience due to road closures. The no action alternative could contribute slightly to the long-term beneficial or adverse impacts on visitor use and experience depending on the view of the visitor.

Conclusion
Depending on the provision of visitor services and individual visitor preferences, alternative A would result in both long-term adverse and beneficial impacts on visitor use and experience. As such, this alternative may contribute slightly to the adverse and beneficial cumulative effects on visitor use and experience, when considered with other past, present, and reasonably foreseeable future actions.

Effects of Alternative B on Visitor Use and Experience
Conducting a geotechnical investigation to determine the engineering feasibility of relocating a portion the Olympic Hot Springs Road and informing long-term planning for the road could be viewed by some visitors as serving a potential long-term beneficial effect on visitor use and experience by facilitating the potential reopening the roadway to visitor use. In contrast, some visitors seeking a different type of park experience may view the off-road access path, helicopter use, and drilling activities as unnecessary noise and visual disturbance resulting in both temporary adverse effects and the potential for long-term adverse effects on visitor use and experience in the area. In addition, potential trail closures for up to three-days each to facilitate drilling operations in the vicinity of the public access trail and temporary delays during helicopter operations would result in localized, short-term adverse impacts on visitor use and

experience. Noise disturbance from the geotechnical drilling would have minimal, short-term, adverse impacts on the natural, undeveloped, and opportunities for solitude qualities of wilderness character due to sound attenuation by the surrounding forest and due to the limited use of this trail.

Mitigation Measures

- Visitors would be informed of geotechnical investigation activities and trail closures from information provided at the visitor center, trailhead, or park website.

Cumulative Effects of Alternative B on Visitor Use and Experience

The Elwha Valley provides a wide range of visitor experiences, from the more natural experiences of walking on nature trails or viewing the Elwha River, to experiences in developed areas at the Elwha Ranger Station and Historic District. As with alternative A, there would continue to be a range of effects on visitor experience, depending on visitor expectations. Because they limit the number and kind of experiences, however, in general, road closures have had and would continue to have an adverse effect on visitor use and experience. Depending on the results from the outcome of alternative B, it could contribute cumulative adverse and beneficial cumulative effects on visitor use and experience.

Conclusion

The proposed action would have short- and long-term beneficial and adverse impacts on visitor use and experience. Contributions to cumulative effects on visitor use and experience would be long-term, adverse and beneficial when considered with other past, present, and reasonably foreseeable future actions.

Chapter 4: Consultation and Coordination

Internal Scoping

The NPS used internal scoping to define the purpose and need for the project. An interdisciplinary team comprised of staff from the park and FHWA was identified. This process continued with identifying potential actions to address the need, and determining what park resources could potentially be affected by the proposal. Internal scoping began during meetings to discuss the long-term plan for the Olympic Hot Springs Road and continued through the development of this EA with additional meetings, including in September 2017 and April 2018. During the design phase, the proposed project areas were surveyed in detail and staked with markers. As the designs developed, they were reviewed and analyzed for potential environmental impacts.

Agency Consultation

U.S. Fish and Wildlife Service

In accordance with the ESA, the NPS contacted the USFWS to determine which federally listed special status species should be included in the analysis. Based on subsequent analysis of the project area and its potential effects, the park has determined that there would be *no effect* on bull trout and designated critical habitat for bull trout. However, the project *may affect*, but *is not likely to adversely affect* marbled murrelets and northern spotted owls (see impact analysis section). During public review of this document, prior to preparing a NEPA decision document, concurrence with these determinations of effect from the USFWS will be sought.

Washington State Department of Archeology and Historic Preservation

A letter was sent to the Washington State Department of Archeology and Historic Preservation on November 17, 2017, requesting concurrence with the area of potential effect. The Department of Archeology and Historic Preservation responded on November 29, 2017, expressing concurrence with the area of potential effect as detailed in the letter. The park is consulting with SHPO for concurrence with the determination that no cultural resources would be affected for the proposed geotechnical investigation.

Native American Indian Consultation

A letter was sent to the Lower Elwha Klallam Tribe on November 17, 2017, describing the project area of potential effect and survey methods, and requesting comments and concurrence on the area of potential effect. The Lower Elwha Klallam Tribe responded on November 21, 2017, expressing with the area of potential effect as described in the letter. The Lower Elwha Klallam Tribe recommended that Olympic National Park review the Tribe's Monitoring and Inadvertent Discovery Plan and provide the Tribe with a current contact list for the proposed project.

List of Preparers, Persons and Agencies Consulted

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