US 101 Elwha River Bridge Replacement
Environmental Assessment

Washington State Department of Transportation
Federal Highway Administration – Washington Division

June 30, 2021

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US 101 Elwha River Bridge Replacement
Clallam County, Washington

Environmental Assessment
Submitted pursuant to 42 U.S.C. 4332(2)(c)

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Acronyms

APE	Area of Potential Effect
BMP	Best Management Practice
CEQ	Council on Environmental Quality
DAHP	Department of Archeology and Historic Preservation
dbh	Diameter at breast height
DOI	Department of the Interior
EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
HED	Highway Easement Deed
LEKT	Lower Elwha Klallam Tribe
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRHP	National Register of Historic Places
NSNSD	Natural Sounds and Night Skies Division
ONP	Olympic National Park
SR	State Route
T&E	Threatened and endangered species
USACE	U.S. Army Corps of Engineers
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

Chapter 1: Background and Purpose and Need

1.1 Background

United States Highway 101 (US 101) is the main artery for travel between the eastern and western sides of the Olympic Peninsula. The highway extends from southern California to the Olympic Peninsula. The highway passes through Olympic National Park (ONP) along Lake Crescent and provides access to some of the more popular and heavily visited areas in the park and on the Olympic Peninsula. The alternate route between Port Angeles and Forks is State Routes (SR or SRs) 112 and 113. SR 112 between Port Angeles and the Makah Indian Reservation is designated as the Strait of Juan de Fuca Scenic Byway. Since US 101 is a through route, the road serves park visitors, commercial users, local commuter, and non-commuter traffic.

The existing US 101 Elwha River Bridge (MP 239.23 to 239.94) is a three-span concrete arch structure with two in-water piers. The current bridge has been undermined by changing river conditions and the original piers were not built into bedrock. The bridge is at risk, and is being monitored for structural failure. Authorized emergency scour repairs were made in October 2016 and July 2017.

1.2 Need and Purpose

1.2.1 Need

The over 90 year-old bridge is past the end of its original design service life. September of 2016, it was determined that the piers that support the existing bridge were being undermined due to changes in river conditions, and it was discovered that original piers were not built on a solid foundation of bedrock. Emergency stabilization of the piers occurred in October 2016 and July 2017, and ongoing bridge monitoring is being provided until long-term public safety needs can be ensured with a bridge replacement. Additionally, improving sight distance will increase overall safety performance of the intersection.

1.2.2 Purpose

The purpose of the project is to provide safe, long term access across the Elwha River on US 101, which provides the primary highway access for the communities and visitors on the Olympic Peninsula (Figure 1).

1.2.3 Cooperating Agencies and the Decision-Making Process

Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA) are leading the project, and the National Park Service (NPS) is a cooperating agency. Maintenance of the US 101 Elwha River Bridge is the responsibility of WSDOT, but the NPS is responsible for managing the adjacent lands to the north and south of the bridge, which are designated by NPS as Elwha Project Lands. The NPS has jurisdiction over actions within the NPS boundary, and WSDOT has a prescriptive easement over this section of US 101 at the current Elwha River Bridge location. WSDOT, FHWA, and the NPS must consider the impacts of the bridge replacement project on the overall project area. If WSDOT and FHWA utilize Elwha Project Lands, a decision document with NPS as a signatory is needed. Once a decision document is completed, WSDOT and FHWA may apply for a Highway Easement Deed (HED) through the Department of the Interior (DOI) to construct on Elwha Project Lands.

Elwha Project Lands are properties owned by the National Park Service that are not intended or managed for public recreation.

This Environmental Assessment (EA), which evaluates impacts of the proposed project on natural, cultural and socioeconomic resources, and visitor use and experience and park operations, will be used to help the NPS Pacific West Regional Director, WSDOT, and FHWA, based on a recommendation from the Superintendent of Olympic National Park, make a decision about whether to approve development on Elwha Project Lands. The decision would be documented in the proposed Finding of No Significant Impact (FONSI) for this EA. Should the EA reveal significant impacts on park resources from the project, an Environmental Impact Statement and Record of Decision would be prepared.

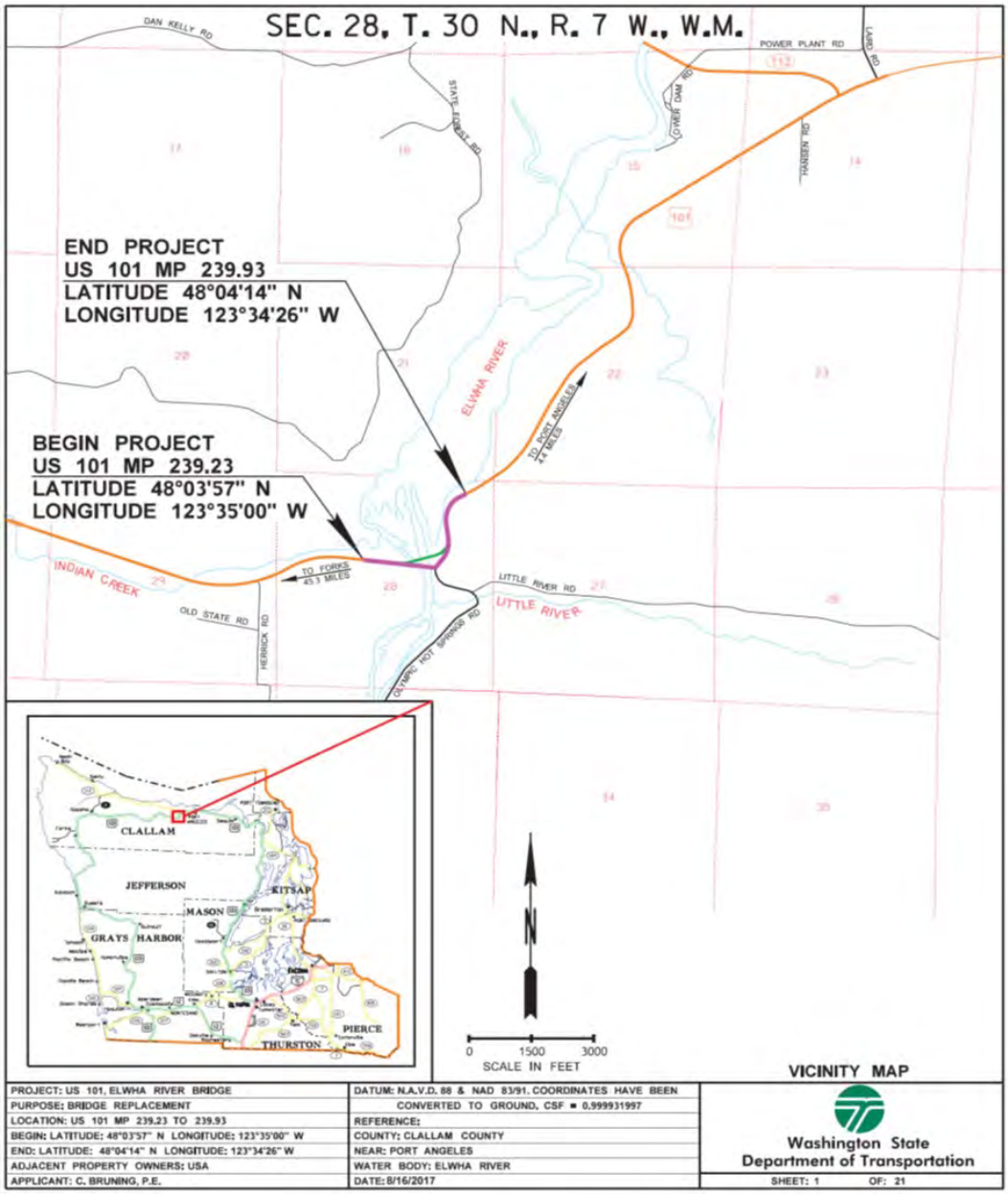


Figure 1. Vicinity Map

Chapter 2: Alternatives

2.1 No Build Alternative

The US 101 Elwha River Bridge would remain open until monitoring determines it to be structurally unsound and not safe for the traveling public. WSDOT's current management strategy is to monitor bridge stability using remote sensing, visual structural inspections at a regular frequency, daily monitoring of river flows, and a rapid response plan to close the bridge and implement a temporary detour if needed. Should monitoring show movement beyond established thresholds, immediate bridge closure and implementation of a preplanned detour would occur. Further structural failure could possibly result in additional temporary bridge stabilization response measures. The scope and scale of these responsive measures cannot be fully envisioned in advance. Eventual controlled bridge removal would result in direct and cumulative effects as described under the Build Alternative throughout this document. Given that this bridge replacement proposal is being planned in response to emergent structural failure of the bridge, a traditional "No Build" scenario is not applicable. The current operational baseline is to manage and operate the structurally deficient bridge for as long as safely possible while planning and design efforts for an appropriate replacement proceed. No Build subsections in the resource impact section (Chapter 3) do not attempt to predict or describe impacts resulting from No Build activities such as a likely controlled bridge removal.

2.2 Build Alternative

The Build Alternative was chosen after a process that evaluated several alternatives. Alternatives considered but not selected are each briefly described in section 2.3. The Build Alternative involves the relocation and construction of the US 101 Elwha River Bridge over the Elwha River on NPS Elwha Project Lands, and realignment of US 101 at the turnoff for Olympic Hot Springs Road (Figure 2) to correct a curve with substandard geometrics and sight distance. WSDOT would build a new bridge on a new alignment just north of the existing bridge. The existing bridge would remain open to traffic during construction, assuming the current bridge remains structurally sound. Once construction

is completed, traffic would be shifted onto the new bridge and the old bridge would be removed. Construction is expected to take 2 years to complete.

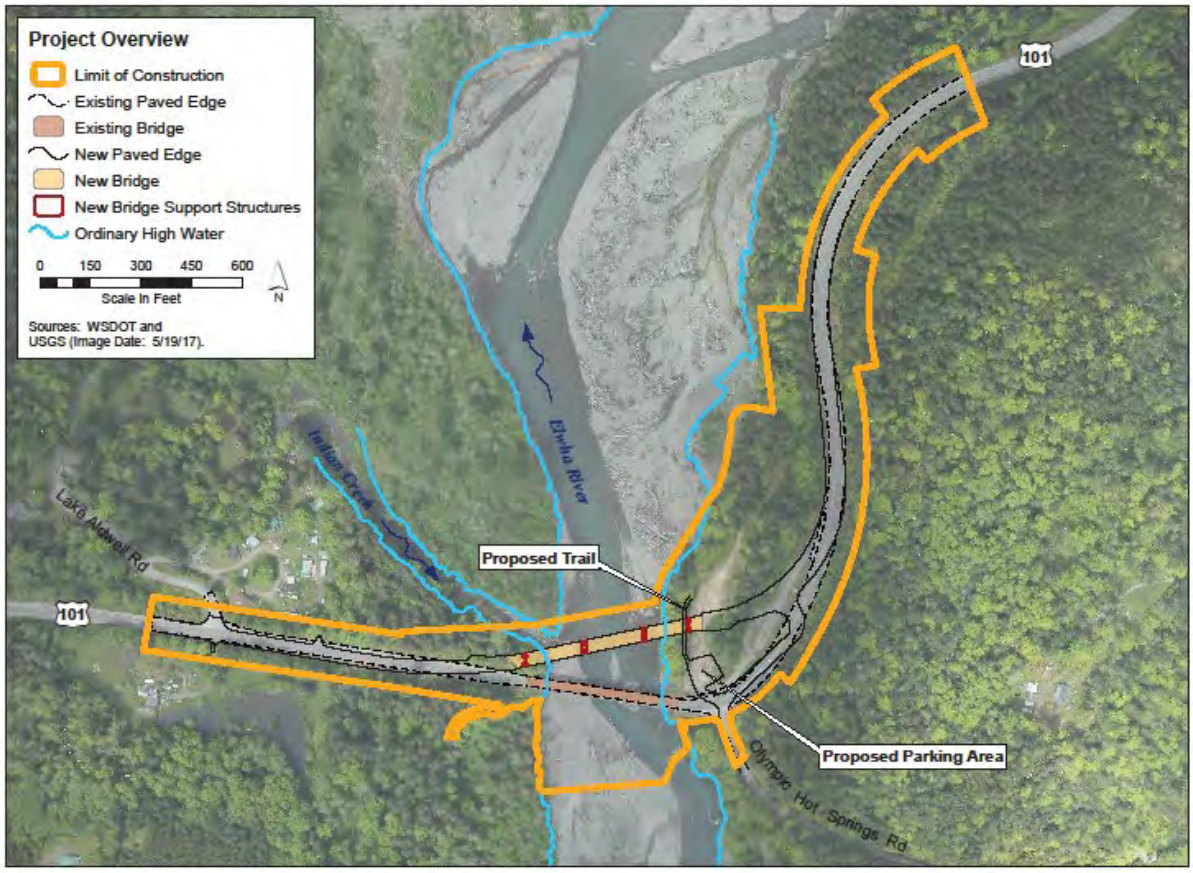


Figure 2. Project Area Overview

Bridge Design

The existing bridge is a three-span concrete arch bridge. The bridge is founded on concrete abutments at each end, with two intermediate concrete solid wall piers founded on spread footings in the Elwha River channel. The replacement bridge would be a fixed-span concrete girder bridge founded on large diameter, cast-in-place concrete drilled shafts. The new bridge would be a three-span structure of approximately 300 feet total span length on a new highway alignment just downstream of the existing bridge (See Appendix F).

The bridge substructure would consist of four piers. Piers 1 and 4 are located at the west and east approach abutments, respectively, and Piers 2 and 3 are located within the Elwha

River channel. The drilled shafts would be founded in bedrock and extend above the 100-year flood elevation. The bridge height over the normal high-water elevation would range from approximately 30 feet at Pier 1 to approximately 48 feet at Pier 4.

Site Preparation and Staging Areas

Land-based construction staging areas would be used for delivering and storing construction materials and equipment, contractor offices and storage trailers, and employee parking. The most suitable locations for these site preparation and staging areas are on the right bank of the Elwha River north of the existing bridge. A large gravel shoulder area along US 101 is also available. An existing gravel driveway into what was previously a resort area would likely serve as the primary construction access and as the staging area for most of the construction material. Construction staging areas could require grading or excavation to level the site and install drainage improvements, depending on site conditions. Drainage conveyance systems for the movement of stormwater from a collection point to an outfall may consist of drainage pipes and temporary stormwater facilities and may use gravity or pumps to move the stormwater.

Office trailers, placed on temporary foundations, would be connected to available utilities, including power and telephone as needed. Connecting to these utilities may involve installing poles for power lines and excavating trenches for underground utility hookups. After construction is completed, the staging areas would be restored and the trailers would be disconnected from any utilities and removed.

Construction Staging and Access

Establishing access to the new bridge pier locations in the river channel would be the first element of work. Access would be gained by constructing temporary access pads in the river bed (Figure 3). These access pads would be constructed of large rock and be designed to withstand the entire range of river flows over the course of a typical year.

Pier and Superstructure Construction

After construction access has been established, pier construction for the new bridge would begin. Each bridge pier would be composed of two large-diameter drilled shafts. After the shaft excavation is completed, reinforcing steel and cast-in-place concrete

would complete each pier foundation. Concrete bridge support columns would be constructed at Piers 2 and 3. Abutment Piers 1 and 4 would have cast-in-place concrete retaining walls around the north, south, and waterward sides of the shafts to complete the abutments. The bridge superstructure would be constructed on top of the support columns, typically with pier caps spanning across the top of the two columns to distribute the weight of the bridge. Precast girders would support a cast-in-place bridge deck.

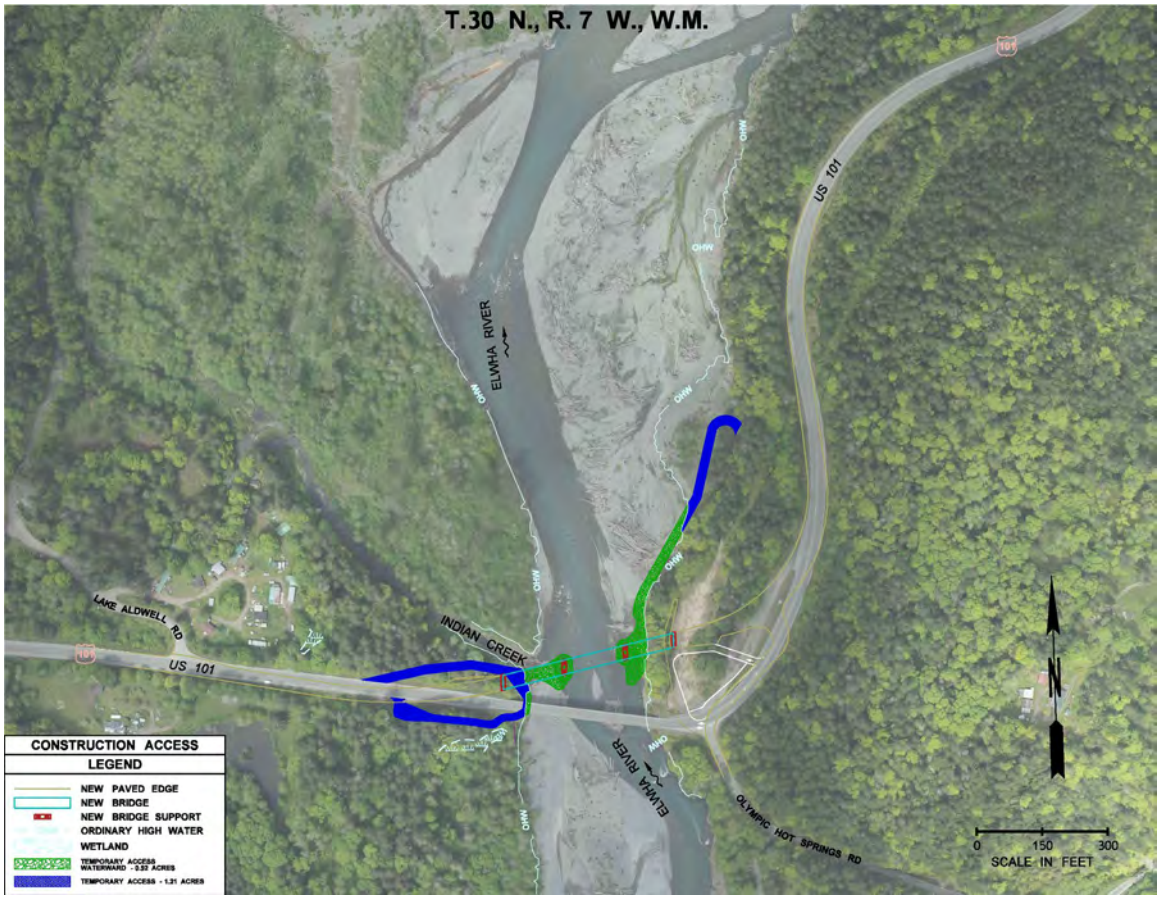


Figure 3. Construction Access

Roadway Construction

The project would also involve the realignment of approximately 0.6 mile of US 101 roadway. This includes approximately 0.2 mile at the west approach and 0.4 mile at the east approach. The roadway improvements would include a new intersection with Olympic Hot Springs Road beginning about 400 feet east of its current location (See Figure 1). Roadway construction would involve excavation and embankment fill,

temporary shoring, retaining wall construction, reconstruction of existing driveway accesses, and establishment of drainage features and stormwater treatment facilities.

Bridge Demolition

After traffic has been shifted to the new bridge, the existing bridge and remaining roadway sections would be demolished. Demolition would need to occur from above and below the bridge out into the Elwha River because of the configuration of the existing bridge. Overwater demolition would occur in two phases: the first phase involves demolishing arches 1 and 2 and Pier 6 from the left-bank side of the river; the second phase involves demolishing arch 3 and Pier 7 from the right-bank side of the river. A construction access pad is proposed in the river channel for each demolition phase. The demolition pads would provide for equipment access and a surface to drop and contain concrete debris for subsequent removal. Demolition access is depicted in Figure 4.

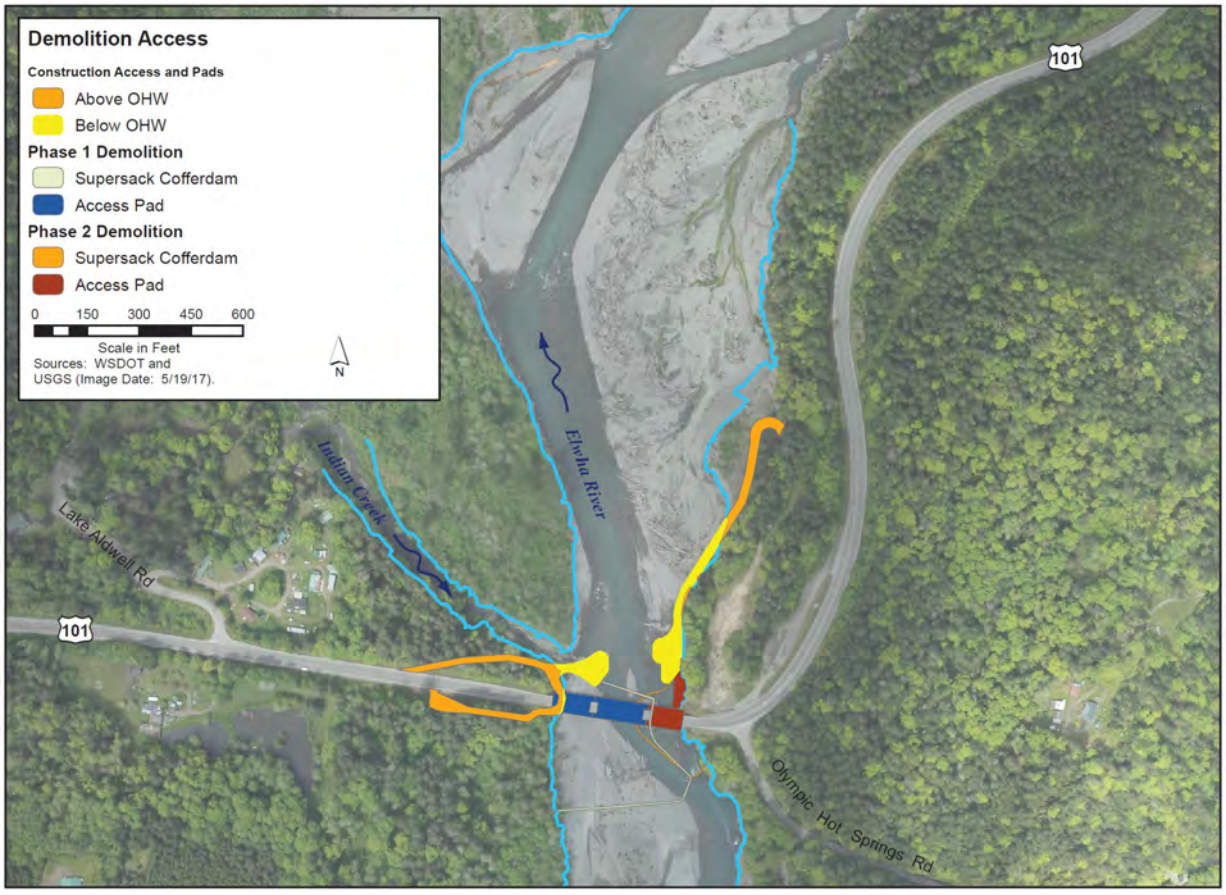


Figure 4. Demolition Access

For each demolition phase, a cofferdam, buttressed with riverbed material, would be constructed upstream of the existing bridge in the Elwha River channel, diverting river flow to isolate the work area. To accommodate streamflow while the diversion is in place, a channel would likely need to be excavated on the left bank side.

Once fish are removed from a work area, and it is dewatered, the demolition pad would be constructed behind the isolation dam, and demolition of the old bridge superstructure and foundations would begin. Fish removal would be done according to WSDOT Fish Exclusion Protocols and Standards (WSDOT 2017c). The process would be repeated for the remaining bridge portion. The demolition pad, isolation dam, and the construction access pad would be removed from the river following the bridge demolition and the river channel would be restored.

Roadway Demolition

The roadway approach sections on either side of the existing bridge abandoned by new highway alignment would be demolished. This work would likely consist of impact-breaking the roadway surface, then removing the asphalt and subgrade with heavy earth-moving machinery. Demolished roadway material would be hauled off site for disposal at an approved facility.

Restoration and Site Cleanup

The final elements of work consist of restoration of temporarily disturbed areas, site cleanup, and demobilization. Affected natural habitat and roadside vegetation would be revegetated with species similar to those removed. Restoration of disturbed areas would generally follow the standards contained in WSDOT's Standard Specifications (WSDOT 2021) for roadside restoration and WSDOT's Roadside Policy Manual (WSDOT 2015). This would generally include placing topsoil, compost, and soil amendments; planting specified native species; and adhering to weed control and plant establishment plans.

Stormwater Management

The new alignment and bridge configuration would result in an increase of impervious surface from 2.9 acres (existing) to 3.3 acres. WSDOT would construct water quality treatment facilities along new roadway segments in accordance with WSDOT's Highway

Runoff Manual. Treatment options are expected to consist primarily of biofiltration BMPs such as vegetated filter strips, biofiltration swales, media filter drains, or bioswales.

Utilities

Utilities at the bridge include Clallam County Public Utilities District Power and Century Link Telecommunications. These utilities are suspended on an aerial crossing. As part of the Build Alternative, existing utilities will remain within the existing right of way by aerial spanning the river at or near the existing location.

2.3 Alternatives Considered but Dismissed

Additional alternatives addressing repair or replacement of the US 101 Elwha River Bridge were considered based on results of internal scoping by WSDOT and FHWA. These alternatives were not carried forward for detailed analysis because of high cost, high level of environmental impact, or because they would not meet the purpose or need. This section discusses those alternatives considered and why each was dismissed from further analysis. Public input on these alternatives is presented in Chapter 4.

2.3.1 New Bridge on Existing Alignment

This alternative involves only reconstruction of the US 101 Elwha River Bridge over the Elwha River in its current location. WSDOT would remove the Elwha River Bridge and build a new bridge at the same location. Existing traffic would be routed onto SRs 112/113 until construction completion. This alternative would take approximately 2 to 3 years to complete. It does not achieve the safety element of the purpose and need since it retains the dangerous horizontal alignment east of the bridge, and does not fix the safety issues at the intersection of US 101 and Olympic Hot Springs Road.

2.3.2 Replace U.S. Highway 101 with State Routes 112 and 113

Under this option, the Elwha River Bridge would be abandoned without plans to reopen or reconstruct the bridge. SR 112 and SR 113 would be improved to better accommodate the increased traffic volumes. Necessary detour upgrades would require 2 to 5 years to complete, with full upgrades of SR 112 and SR 113 to National Highway System

standards requiring up to 10 years to complete. Permanent rerouting of US 101 traffic to SR 112 and SR 113 would require right-of-way permits, upgrades over multiple construction seasons, and intersection improvements. This alternative would lead to longer travel and emergency response times. The speed limit would need to be reduced due to the geometric design of the roads. The cost of eventual bridge removal would be approximately $1.2 million in addition to another approximately $95 million to bring SRs 112 and 113 up to National Highway System standards over 10 years. Utilities would require relocation. For all the above reasons, this alternative was not moved forward for further consideration.

2.3.3 Develop Alternate Highway West of State Road 112 Bridge

Under this alternative, WSDOT would construct a new two-lane highway on or near Eden Valley Road between US 101 and SR 112. The existing Elwha River Bridge would be used until the new route was complete, assuming the bridge remains structurally sound, after which the bridge would be removed and traffic would be routed onto the new highway. WSDOT would also upgrade existing US 101 and SR 112, including building new intersections, repaving, and adding safety features. This alternative would require the purchase of a large amount of right-of-way. It would also extend emergency service response times and extend the commute between Forks and Port Angeles by 10-15 minutes. For these reasons, this alternative was not moved forward for further consideration.

2.3.4 Retrofit Existing Bridge

Under this alternative, WSDOT would retrofit the existing bridge and stabilize its foundation. Vehicles would continue to use the bridge, assuming the bridge remains structurally sound, with occasional single lane closures and detours onto SRs 112 and 113 until the project was complete. This alternative was dismissed as the existing bridge is over 90 years old and a new bridge would be required within 10-15 years. Future deck replacement within 5 years would cause significant traffic impacts, including a detour, during construction. Utilities would need to be relocated. This alternative does not

improve the US 101 alignment or fix the safety issues at the intersection of US 101 and Olympic Hot Springs Road.

2.3.5 New Bridge on Parallel Alignment

Under this alternative, WSDOT would build a new bridge adjacent to the existing bridge rather than the Build Alternative's more northern alignment. The existing bridge would remain open to traffic during construction, assuming the bridge remains structurally sound. After construction was complete, traffic would be diverted onto the new bridge and the old bridge would be removed. Right-of-way permits would be required. This alternative would also require a permanent alignment shift onto the bridge making the curve at the end of the bridge sharper. Utilities would need to be relocated. For these reasons, this alternative was not moved forward.

Chapter 3: Affected Environment and Environmental Consequences

3.1 Introduction

Information in this section is derived from a comprehensive review of existing information pertaining to the project area. It includes information from the Olympic National Park General Management Plan (NPS 2008), the Elwha River Ecosystem Restoration/Final Environmental Impact Statement Elwha River Ecosystem Restoration (NPS 1996), 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 ONP. Methods used for the analysis are presented below and further explained under each impact topic.

Impact topics retained include geology and soils, vegetation, water resources, wetlands, fish, wildlife, threatened and endangered species, cultural resources, Section 4(f), visual resources, land use, transportation, public access, noise/soundscapes, environmental justice, greenhouse gases, and climate change. The impact topic of Section 6(f) of the Land and Water Conservation Fund Act must be considered for all U.S. Department of Transportation (USDOT) project. Section 6 (f) analysis is not included in this document because there are no Section 6(f) resources in the project area.

3.2 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 in *Environmental Consequences*, analysis is based on a q/ualitative assessment of impacts.

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 effects (APE).

b. Type of Impact

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

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

Impact Analysis

Impacts on various resource topics are compared for each alternatives by describing qualitative or quantitative differences. Special Status Species and Cultural Resources impact determinations are formally determined under the Endangered Species Act (ESA) (Section 7) and the National Historic Preservation Act (NHPA) (Section 106), respectively. Section 4(f) of the Department of Transportation Act of 1966 requires that publically owned parks, recreation areas, wildlife and waterfowl refuges, or certain public or private historic sites be evaluated and avoided. In accordance with NPS *Management Policies 2006*, the analysis in this EA fulfills the responsibilities of the NPS under Section 106 of the NHPA.

3.3 Cumulative Impact Scenario

The Council on Environmental Quality (CEQ) describes a cumulative impact as follows (CEQ 2005):

> *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 any 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 the project.

Past, Present, and Reasonably Foreseeable Future Actions in Olympic National Park and the Overall Project Area

Past Actions/Projects:

Elwha River Ecosystem and Fisheries Restoration/EIS *(Olympic National Park)*
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 ecosystem is recovering, the fluctuations in sediment and river channel migration have washed out portions of the floodplain and led to public and administrative access issues in the Elwha Valley.

WSDOT and FHWA Emergency Actions for the US 101 Elwha River Bridge

Emergency repairs completed in October 2016 and August 2017 were short-term responses to the conditions that necessitated the replacement of the existing bridge. In October 2016, WSDOT requested and received emergency authorization from NMFS, USFWS, WDFW, and the USACE to place 700 cubic yards of large rock around two bridge piers in the Elwha River. The objective of the work was to provide for the protection of the bridge against imminent catastrophic failure caused by the river undermining the piers. WSDOT determined that additional geotechnical investigation and scour protection was necessary. The results of hydraulic modeling and analysis indicate that at a velocity of 9 feet/second (equivalent to the 10-year storm event), the rock that was placed in October 2016 could move and additional scour could occur. Visual inspections confirmed that rock was displayed during high-flow events over the winter and that additional scour protection would be necessary to safeguard the bridge. Installation of the additional protection took place from August 28 to August 31, 2017.

Present Actions/Projects:

U.S. Highway 101 at Lake Crescent and East Beach Road Rehabilitation/EA (Olympic National Park)

This EA was finalized in August 2016 and implementation began in 2017. The purpose of this project is to rehabilitate 12.3 miles of US 101 adjacent to Lake Crescent and 4.0 miles of East Beach Road to address safety and long-term maintenance concerns. Rehabilitation actions include repair pavement deterioration and stabilize road shoulders, improve drainage, replace guardrail, conduct rockfall mitigation, improve Sledgehammer Point, construct Barnes Point transit stop, and modify turnouts along Lake Crescent. East Beach Road modifications have already been completed, and included new asphalt pavement surfacing, culvert improvement, replacement of nine culverts, and striping and signing. Actions applicable to both US 101 and East Beach Road include replace asphalt concrete paving, replace roadway signs, and conduct revegetation/restoration in disturbed areas. During the construction seasons, visitors and local commuter traffic experience regular 30-minute delays and have experienced longer delays.

Temporary Off-road Access for Geotechnical Investigation/EA *(WSDOT)*

Geotechnical investigation is required to inform the decision-making for the Olympic Hot Springs Road long-term planning project. Geotechnical investigations are being conducted off-road and within the road prism between the Madison Falls parking area and the Boulder Creek Trailhead parking area. There are approximately 22 off-road drilling sites and approximately 20 drilling sites within the roadway surface. The off-road investigations begin at about 800 feet north of the Sanders Creek temporary bridge and end at the Ranger Station. The road closure has impacted public use within the Elwha Valley due to no vehicle access to areas beyond the Madison Falls Trailhead and parking area. During drilling and monitoring activities, the road remains open to foot and bicycle traffic, as accessed via the Bypass Trail.

WSDOT Maintenance of US 101

WSDOT conducts routine maintenance activities on US 101. These activities include: repair pavement cracks and holes, restriping, ditch cleaning, sign repair or replacement, vegetation control, litter pickup, snow/ice management, and tasks associated with bridges, guardrails, and related structures, slide removal, repair of erosion damage, unplanned road closures, and removal of fallen trees. Construction activities include, but are not limited to, overlay, chip and seal, other resurfacing, reconstruction, and general rehabilitation.

Military, Commercial, and Private Overflights

Overflights of the project area by military, commercial, and private aircraft would occur for the duration of bridge construction activities. Most overflights are not low-level events, generally occurring between 10,000-35,000 feet above mean sea level. These flights may increase in number of aircraft and frequency of flights. Sound associated with overflights of new military aircraft may likely be louder in the future. Commercial overflights occur daily and at high levels (above 30,000 feet), where they could affect the acoustic environment over large distances but not at levels that would be highly disruptive to humans or wildlife. Private overflights occur less frequently and at the lower

range of the above-referenced elevations (closer to 10,000 feet), but generally have similar impacts as commercial flights. Military overflights occur less frequently than commercial flights, however, military jets are considerably louder than commercial jets and could thus be audible to visitors and wildlife over the project area.

Reasonably Foreseeable Future Actions:

DelHur Industries New Mining and Processing Area

The proposal would establish a 19.35 acre gravel pit on the northern portion of an approximately 30-acre parcel. The material will be extracted through the use of loaders, excavators, and trucks. The proposal would produce an estimated 750,000 cubic yards of material per year over a 10 to 20 year period, depending on demand. The project site is located about 700 feet north of US 101 and about 0.5 miles west of the Elwha River. This project is currently under environmental review.

Olympic Hot Springs Road Long-term Plan/EA *(Olympic National Park)*

The intent of this project is to improve the condition of the Olympic Hot Springs Road, enabling the roadway to be able to withstand periodic inundation, stabilizing the upper segment of roadway, and to reduce maintenance needs of the roadway while continuing to provide public access into the Elwha Valley. Rehabilitation activities typically include, but are not limited to: subsurface improvements, new pavement, fill slope stabilization, drainage improvements, guardrail improvements, ditch cleaning, and intersection improvements. Additionally, this project may relocate or armor approximately one mile of roadway that has been repeatedly damaged by floodwaters since the removal of the Glines Canyon Dam in 2014. During construction, the road would remain closed to vehicle use, but open to foot and bicycle traffic.

3.4 Affected Environment and Impact Analysis

3.4.1 Geology and Soils

The Elwha River Valley consists of a series of relatively narrow bedrock canyons and wide lower-gradient, flat alluvial sections. Surface deposits in the project area are dominated by glacial deposits and recent alluvium. The glacial sediments provide much

of the sediment transported by the Elwha River. Alpine glaciers, which extended at least as far as the southern end of Lake Aldwell (FERC 1993), carved out the wide bottom lands in weaker rock units, whereas canyons were formed in more resistant lithologies. The topography within the region was influenced by alpine glaciers flowing from the Olympic Mountains, and the Juan de Fuca lobe of the Vashon continental glacier, which covered the lower Elwha River (NPS 1996).

A sequence of alluvial, glacial, and non-glacial deposits comprises the unconsolidated hydrogeologic system in the lower Elwha River Basin, which includes the project area. The older glacial and non-glacial units were deposited first, covering the bedrock surface that slopes downward toward the north. The Elwha River Valley is cut into these deposits. Recently deposited alluvial sediment partially fills the valley floor. The width of the alluvium is restricted by relatively steep bedrock and glacial deposit bluffs (NPS 1996). There are no bedrock outcrops within the project area.

Soils in the vicinity are post-Pleistocene (less than 8,000 years old) and are developed either directly from glacial sediments, or on alluvium or colluvium derived primarily from glacial sediments. According to the Clallam Soil Survey (USDA 1979), Puget silt loam soil underlies the project area. This very deep, poorly drained soil is on low terraces and floodplains (slope of 0-3%). It has been artificially drained. Permeability is moderately slow. The available water capacity is high. The effective rooting depth is limited by a seasonal high water table that is at a depth of 4 to 6 feet from November through April. Runoff is medium, and the hazard of water erosion is slight. This soil is subject to occasional flooding for brief periods from December through March (USDA 1979).

Soil compaction has occurred in some parts of the project area due to human activity including the construction and maintenance of US 101. In these areas, runoff is moderate on poorly drained soils, and the capacity of the soil to support vegetation has been reduced.

Effects of the No Build Alternative on Soils

Under the No Build Alternative, the bridge would remain open until monitoring shows that it is no longer structurally sound. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, the No Build Alternative would not have any direct adverse impacts on soils within the project area.

Cumulative effects of the No Build Alternative on Soils

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on soils. The regular maintenance of US 101 may have resulted in some soil disturbance and compaction and would continue to be minimal; a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would likely result in extensive soil disturbance and compaction in the foreseeable future within the Elwha Valley; and changing river conditions to more natural flows since dam removal have had beneficial impacts on soils and overall river ecology. There would be no additional impact to soils from the No Build Alternative and it would not add to the overall adverse cumulative effect on soils in the Elwha Valley.

Effects of the Build Alternative on Soils

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would have long-term direct, adverse impacts on soils due to new bridge construction, removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. Construction ground-clearing activities would temporarily expose soils to erosive forces. Soil loss from erosion could affect surface water resources and associated habitat by adding suspended solids and increased turbidity into the Elwha River or Indian Creek at the confluence of the Elwha River. These impacts would be due to the removal and compaction of soils within both the WSDOT right-of-way, the riparian area, and on NPS Elwha Project Lands where the new bridge would be constructed.

Mitigation Measures

Consideration will be given to limiting earthwork operations to the drier times of the year when erosion potential is reduced. This can be accomplished by careful planning of construction staging and by the use of geometric covers. Potential for erosion during construction operations would be reduced by following the BMP's outlined in the Temporary Erosion and Sediment Control (TESC) Plan sections of WSDOT's Highway Runoff Manual and Environmental Manual.

Cumulative effects of the Build Alternative on Soils

The cumulative effects to soil resources are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions have had and continue to have short- and long-term, adverse and beneficial effects on soils within the Elwha Valley. The proposed action would contribute a considerable increment to the overall long-term, adverse cumulative impact on soils.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on soils. This alternative would not contribute to the cumulative disturbance of soil resources when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in direct, localized, long-term adverse impacts to soil resources. The Build Alternative would contribute a minor increment to the overall long-term, adverse, cumulative impacts on soils.

3.4.2 Vegetation

The project area is located within the western hemlock zone. This zone has the most extensive native vegetation type in western Washington and Oregon (Franklin and Dyrness 1988) and is characterized by a wet, mild, maritime climate with relatively dry summers. Throughout this zone, mature forest communities are characteristically dominated by western hemlock and Douglas-fir. Dominant understory species composition is shaped by different moisture regimes that reflect elevation, soil type, slope, and aspect, and ranges from scouring rush in wet areas, sword fern in transition zones, and Oregon grape in the driest sites.

Riparian vegetation in the project area is limited to the floodplain of the Elwha River and its tributaries. Composition and structure vary with the age of the floodplain surface; mature terraces may be dominated by large red alder or big-leaf maple; more recent surfaces have thick stands of younger alders and maples, sometimes mixed with Sitka willow, and the youngest surfaces have only herbaceous species such as riverbank lupine or annual grasses.

Exotic species are abundant because of the highly disturbed nature of the project area and its proximity to human developments. Scotch broom, Canada thistle, creeping buttercup, and reed canarygrass are the most widespread of the dozens of exotic species in the area. Threatened or endangered plants are not known to occur within the immediate vicinity of the project (WNHP 2017). *Whipplea modesta* (modesty) and *Montia diffusa* (spreading minor's lettuce), which are on the Washington State rare plant list, have been observed in the general area.

Effects of the No Build Alternative on Vegetation

Under the No Build Alternative, the bridge would remain open until monitoring shows that it is no longer structurally sound. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, the No Build Alternative would not have any direct adverse impacts on vegetation within the project area.

Cumulative effects of the No Build Alternative on Vegetation

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on vegetation. The regular maintenance of US 101 may have resulted in some vegetation compaction or removal and would continue to be minimal; a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would likely result in extensive vegetation removal and compaction in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on vegetation and overall river ecology. There would be no additional impact to

vegetation from the No Build Alternative and it would not add to the overall adverse cumulative effect on vegetation in the Elwha Valley.

Effects of the Build Alternative on Vegetation

Under the Build Alternative, the bridge would be reconstructed north of its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would have short- and long-term direct, adverse impacts on native vegetation due to new bridge construction, removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. These impacts would be due to the removal of or damage to native vegetation within the WSDOT right-of-way, the riparian area, and on NPS Elwha Project Lands where the new bridge would be constructed.

The roughly nine acres of permanent vegetation impact have a species composition that is predominantly native. Tree survey data collected by WSDOT identify 461 trees within the clearing limits for the project. Of these, 199 are conifers between 4 and 30 inches diameter breast height (dbh), and 21 are trees (conifer or hardwood) greater than 30 inches dbh. Effected coniferous tree species include grand fir, western hemlock, Douglas-fir, and western red cedar. Effected deciduous tree species include big-leaf maple, red alder, and black cottonwood. Dominant understory species include salmonberry, salal, oceanspray, osoberry, black twinberry, Oregon-grape, twinberry, and swordfern. Herbaceous species include woodland strawberry, coltsfoot, waterleaf, yellow violet, yerba buena, inside-out-flower, and rosy twisted stalk.

Short-term effects would also occur outside of the construction footprint. These include areas designated to be temporarily affected by the staging of construction equipment, and areas within ten feet of cut and fill lines that are designated for clearing and grubbing.

Mitigation Measures

Temporary impact areas would be restored with native trees and shrubs appropriate for specific region and conditions of the site and per the WSDOT Roadside Manual and collaboration with the National Park Service. The vacated US 101 roadway would similarly be restored where project elements such as the realigned turnoff for the

Olympic Hot Springs Road or stormwater treatment facilities are not designated. A total of 5.14 acres of project area are designated for restoration with native vegetation as part of the Build Alternative.

Cumulative effects of the Build Alternative on Vegetation

The cumulative effects to vegetation are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on vegetation. The proposed action would contribute a considerable increment to the cumulative adverse effects from the removal of vegetation.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on vegetation. This alternative would not contribute to the cumulative disturbance of vegetation when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in short- and long-term, localized, adverse effects on vegetation. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute a considerable increment to the short- and long-term, adverse cumulative effects on vegetation.

3.4.3 Water Resources

Water sources are typically subdivided into two types: surface water and groundwater. Surface water resources are essential to maintaining human health, fish, wildlife habitat, and vegetation. Groundwater resources serve as underground storage of freshwater that can be used for drinking, irrigation, recharge areas, and general water supply. Floodplains are related water resource areas where surface water inundates low-lying ground during a flood event. Groundwater and floodplain resources would not be effected by either project alternative and are not further discussed in this EA. A discussion of existing surface water resources and potential project effects on those resources follows.

The project is located in Water Resource Inventory Area (WRIA) 18 Elwha/Dungeness which drains north to the Strait of Juan de Fuca. The study area for surface water encompasses the immediate project vicinity as well as the downstream receiving water bodies in WRIA 18. The Elwha River is 45 miles long, has 100 miles of tributaries and streams, and drains 321 square miles of the Olympic Peninsula. Eighty-three percent of the drainage lies within ONP, comprising 20% of the total park area. The river and its tributaries are classified by the Washington Department of Ecology (Ecology) as Class AA waters, signifying "extraordinary" quality.

Overall, the Elwha River has relatively low concentrations of dissolved and suspended sediment loads, nutrients, and organics. Changes in natural water quality occur in the lower part of the watershed, mostly as a result of elevated water temperatures during the summer. Turbidity of the lower river is related to flood flows, logging, agricultural practices, and bank erosion. In addition to the Elwha River, Indian Creek is the other surface water resource in the immediate project vicinity, its confluence with the Elwha River is just northwest of the existing bridge. Indian Creek drains Lake Sutherland and flows through an area of second growth timber and intermittent farmland.

Effects of the No Build Alternative on Surface Water

Under the No Build Alternative, the bridge would remain open until monitoring shows that it is no longer structurally sound. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, the No Build Alternative would not have any direct adverse impacts on surface water within the project area.

Cumulative effects of the No Build Alternative on Surface Water

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on surface water. The regular maintenance of, as well as regular commercial and private vehicle use on, US 101 may have resulted in some surface water contamination from stormwater runoff and motor vehicle pollutants and would continue to be minimal; potential rehabilitation or relocation of the Olympic Hot Springs Road may result in some sedimentation and contamination from stormwater runoff, and construction or passenger

vehicle pollutants in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on surface water quality, quantity, and overall river ecology. There would be no additional impact to surface water from the No Build Alternative and it would not add to the overall adverse cumulative effect on surface water within the Elwha Valley.

Effects of the Build Alternative on Surface Water

Short-term effects: Based on the preliminary hydraulic model results, there may be temporary erosion/scour of the Elwha riverbed and potential for temporary bed coarsening due to the modeled flows assessed during the construction phases. Potential substrate and sediment changes through the project site are dependent on many factors, but are largely a function of the flows which may occur during the timeframes for each construction phase. Such effects are natural processes that may occur at the same magnitude during a larger flow event under existing conditions.

Potential scour and/or deposition at the confluence of Indian Creek is also dependent on many factors. It is, however, largely a function of the flows which may occur during the timeframes for each construction phase. Nine different scenarios were modeled and presented in the project's preliminary hydraulic report. Analysis indicates that there should not be a significant increase in scour or deposition occurring at the Indian Creek-Elwha River confluence beyond existing conditions.

The greatest geographical extent of water quality effects in the Elwha River is conservatively estimated to be 2,400 feet downstream from the existing bridge. The geographical extent of water quality effects also includes the lower reaches of Indian Creek, downstream of the stormwater discharge point in that stream. Such areas would also be affected by riparian clearing for construction access. Construction ground-clearing activities would temporarily expose soils to erosive forces. Soil loss from erosion could affect surface water resources and associated fish habitat by adding suspended solids and increased turbidity into the Elwha River or Indian Creek.

Spills or leaks of hazardous materials could occur within the project limits where construction equipment is parked, used, fueled, or maintained; or where hazardous materials are stored. In addition, concrete leachate may be generated during roadway and bridge construction. If these substances enter the Elwha River, they may degrade water quality, resulting in negative impacts on aquatic resources, including fish and the species upon which they feed.

Long-term effects: The potential for lateral migration of the Elwha River was considered for the Build Alternative. WSDOT will monitor channel movement towards the southwest side of US 101, no scour countermeasure is anticipated for construction of the new US 101 bridge in this location. The east abutment is outside of the 100-year flood inundation limits and would be designed on bedrock. Lateral river migration to the east should not be a concern. If further analysis suggests potential for lateral river migration to the west, a properly designed scour countermeasure would be constructed to minimize any future need to address scour of the roadway.

Based on preliminary hydraulic modeling, the Build Alternative should not have notable effects on natural river processes. The bridge abutments are located outside the 100-year floodplain and the two in-water piers are located on the current channel boundaries where velocities are lower than the main channel. The in-water piers would be designed to account for total scour and therefore would not require any rock armoring now or in the future. The proposed bridge would be designed to allow for the Elwha River channel to adjust both laterally and vertically and allow the natural movement of water, sediment, and wood.

Mitigation Measures

Water quality effects would be limited by the use of Best Management Practices (BMPs) which would be outlined in the contract specifications for the project. The project would maintain compliance with state water regulations in WAC 173-201A and with ESA Section 7 consultation terms and conditions. Despite BMPs, in-water construction would generate suspended sediment and turbidity effects. WSDOT would request from Ecology a short-term modification to the prescriptive water quality standards for turbidity

pursuant to WAC 173-201A-410 to authorize a point of compliance 1,500 ft downstream of construction activities.

New pollutant generating impervious surface (PGIS) would be constructed as part of this project. This would be off-set to a large extent by the removal of area associated with the existing bridge and approaches. Before project completion, WSDOT would install water quality treatment facilities along new roadway segments and construct conveyance structures to carry stormwater to planned discharge points. Stormwater would sheetflow off the roadway into roadside swales, ditches, and strips, where runoff treatment methods would be installed. Cross culverts would be used where needed to convey water across the roadway. Stormwater treatment options are expected to consist primarily of biofiltration BMPs such as vegetated filter strips, biofiltration swales, media filter drains, or bioswales. Since stormwater treatment is not currently provided along this portion of US 101, the project would provide a long-term benefit to water quality through treatment of stormwater runoff.

Cumulative effects of the Build Alternative on Surface Water

The cumulative effects to surface water are similar to those described in the Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on surface water. The proposed action would contribute a short-term increment to the cumulative adverse effects during construction activities due to water diversion that may affect natural and ecological processes, sedimentation from exposed soils, and the potential for spills or leaks from construction equipment. However, with the installment of a stormwater treatment system, the project would add to the long-term beneficial effects.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on water quality. This alternative would not contribute to the cumulative disturbance of surface water when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would

result in short- and long-term, localized, adverse effects on surface water. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute incrementally to the short-term adverse and long-term beneficial cumulative effects on surface water. The project would provide a long-term benefit to water quality through treatment of stormwater runoff.

3.4.4 Wetlands

Wetlands are areas where water is present at or near the ground surface either all year or for varying periods of time during the year. Wetlands are important because they provide essential functions and also help protect human communities. Wetlands improve water quality in streams, rivers, and lakes by filtering pollutants, they protect neighboring areas by retaining flood waters, and they often recharge groundwater. Wetlands provide fish and wildlife habitat, and host a wider variety of plant and animal species than other land types.

Wetlands are categorized into four categories. Category 1 wetlands are the highest quality and Category 4 wetlands are the lowest quality.

Two Ecology Category II wetlands were identified in the project area. Both identified wetlands support a wide array of functions across the three broad categories of functions (Water Quality, Hydrologic, Habitat). Wetland A is a large riverine wetland west and south of the existing Elwha River Bridge. Hydrology (sources of water for these wetlands) is provided primarily by groundwater and overbank flooding. Wetland B is a small riverine wetland flanking both sides of a tributary to Indian Creek north and west of the US 101 Elwha River Bridge. Sources of water for Wetland B include primarily groundwater and overbank flooding from the stream. The locations of Wetlands A and B are shown in Figure 5.

Figure 5. Wetland Location Map

Effects of the No Build Alternative on Wetlands

The No Build Alternative would have no impacts on wetlands and wetland buffers since no actions are proposed under this alternative, work would not occur within wetlands or their buffers identified in the project area.

Cumulative effects of the No Build Alternative on Wetlands

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on wetlands. The regular maintenance of, as well as regular commercial and private vehicle use on, US 101 may have resulted in some wetland contamination from stormwater runoff and motor vehicle pollutants and would continue to be minimal; potential rehabilitation or relocation of the Olympic Hot Springs Road may result in some impacts on wetlands from sedimentation and contamination from stormwater runoff, and

construction or passenger vehicle pollutants in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on wetlands and overall river ecology. There would be no additional impact to wetlands from the No Build Alternative and it would not add to the overall adverse cumulative effect on wetlands within the Elwha Valley.

Effects of the Build Alternative on Wetlands

Although direct impacts to Wetland A and B have been completely avoided, impacts to the buffers of each wetland remain. Permanent wetland buffer impacts to Wetland A and B are estimated to be 0.38 and 0.43 respectively.

Mitigation Measures:

The most substantial avoidance and minimization measure implemented was to locate the bridge alignment to the north of the existing bridge. Early conceptual design alternatives included bridge alignments to the south of the existing bridge. Southern alignments would have included substantial impacts to Wetland A or other wetlands further to the south. Wetland avoidance and minimization was a primary consideration involved in selecting an alignment alternative to the north. A proposed temporary construction access road near Wetland A was also situated north of Wetland A to avoid direct impacts. Direct impacts to Wetland B were avoided by merging the proposed highway alignment with existing US 101 to the east of Wetland B (Figure 5).

Cumulative effects of the Build Alternative on Wetlands

The cumulative effects to wetlands are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on wetlands. The proposed action would contribute a short-term increment to the cumulative adverse effects during construction activities due to water diversion that may affect natural and ecological processes in wetlands, sedimentation in wetlands from exposed soils, and the potential for spills or leaks from construction equipment. However, with the installment of a stormwater treatment system, the project would add to the long-term beneficial effects. These collective actions have resulted in wetland resources that

are likely still fewer and more static compared to historic conditions. The project, which includes no direct impacts to wetlands and a total of 0.81 acre of impact to the buffers of Wetlands A and B, does not meaningfully contribute to cumulative effects on the overall resource. In combination with the impacts of other past, present, and reasonably foreseeable future actions, long-term adverse cumulative effects on wetlands would result from the impacts to the buffers of Wetland A and B.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on wetlands. This alternative would not contribute to the cumulative disturbance of wetlands when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in indirect, long-term, localized, adverse effects on wetlands. There would be a long-term localized beneficial effect from the project with a greater distance and buffer between the new bridge and Wetland A. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute incrementally to the short- and long-term, adverse and beneficial cumulative effects on wetlands.

3.4.5 Fish

Ten stocks of anadromous salmon and trout are either now present in the Elwha River or were known to be present before the dams were built. They are winter and summer Puget Sound steelhead trout (*Oncorhynchus mykiss*); coho (*Oncorhynchus kisutch*); summer/fall and spring Puget Sound Chinook (*Oncorhynchus tshawytscha*); pink (*Oncorhynchus gorbuscha*), chum (*Oncorhynchus keta*), and sockeye (*Oncorhynchus nerka*) salmon; cutthroat trout (*Oncorhynchus clarkia*); and native char (Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*). Pacific (*Lampetra tridentate*) and brook (*Lampetra richardsoni*) lamprey have also been documented in the Elwha River. In addition to these anadromous species, the Elwha River harbors many other species of non-migrating fish (e.g., sculpins, resident cutthroat). The Elwha River is currently the largest producer of steelhead and Chinook salmon on the Strait of Juan de Fuca and is

second only to the Dungeness River for coho. Nearly all Chinook, coho, and steelhead are hatchery-produced.

Federally threatened fish species under the Endangered Species Act (ESA) include the Puget Sound Chinook, Puget Sound steelhead, eulachon, and bull trout. Also, Puget Sound Chinook, coho, and pink salmon are federally listed species under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Impacts to these fish species, critical habitat, and essential fish habitat are analyzed in the Biological Assessment dated September 2017 and are addressed in the Threatened and Endangered Species section within this chapter.

This section focuses on coho, chum, and sockeye salmon; cutthroat trout; Pacific and brook lamprey; and other non-listed fish species. The one known Dolly Varden population in the Elwha watershed is located in Boulder Creek above an anadromous barrier, therefore Dolly Varden would not be affected by this project.

Effects of the No Build Alternative on Fish

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, the No Build Alternative would not have any direct adverse impacts on fish within the project area.

Cumulative effects of the No Build Alternative on Fish

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on fish and fish habitat. The regular maintenance of, as well as regular commercial and private vehicle use on, US 101 may have resulted in some contamination from stormwater runoff and motor vehicle pollutants and would continue to be minimal; potential rehabilitation or relocation of the Olympic Hot Springs Road may result in some impacts from sedimentation and contamination from stormwater runoff, and construction or passenger vehicle pollutants in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on fish, fish habitat,

and overall river ecology. There would be no additional impacts to fish or fish habitat from the No Build Alternative and it would not add to the overall adverse cumulative effect on fish or fish habitat within the Elwha Valley.

Effects of the Build Alternative on Fish

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would have short-term direct, adverse impacts on fish and fish habitat during new bridge construction, the removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. Fish may be disrupted and displaced due to noise generated from the use of heavy equipment, concrete saws, and other construction equipment; as well as from in-water work. Fish habitat may also be removed or damaged during construction of the new bridge, demolition of the current bridge, and through any sedimentation from the realignment of the highway and clearing for bridge development. Spills or leaks of hazardous materials could occur within the project limits where construction equipment is parked, used, fueled, or maintained; or where hazardous materials are stored. In addition, concrete leachate may be generated during roadway and bridge construction. If these substances enter the Elwha River, they may degrade water quality, resulting in adverse impacts on aquatic resources, including fish and the species upon which they feed.

Mitigation Measures:

The project Biological Assessment (Section 1.4) (WSDOT 2017a) prescribes numerous specific impact avoidance and minimization measures pertaining to fish species. These include species specific measures, general impact avoidance and minimization, BMP's to reduce the risk of delivering sediment to waterbodies, BMP's to reduce the risk of introducing pollutants to waterbodies, and BMP's for in-channel construction (e.g. restricting work to approved "in-water work windows"). Additionally, project activities will fully comply with the Hydraulic Project Approvals (HPAs) issued for the project by WDFW.

In addition, to mitigate for in-stream impacts the project will install engineered log jams to improve habitat for aquatic species and improve river dynamics by minimizing erosion and potential for unscheduled bridge maintenance . The location and configuration of this mitigation is being developed in coordination with the LEKT. A preliminary layout of engineered log jam arrays both upstream and downstream of the highway crossing has been identified (Figure 6) and will proceed to final design and permitting for inclusion in bridge construction. Water quality mitigation measures specified under the Water Resources section would also apply here with impact mitigating benefits to fish species.

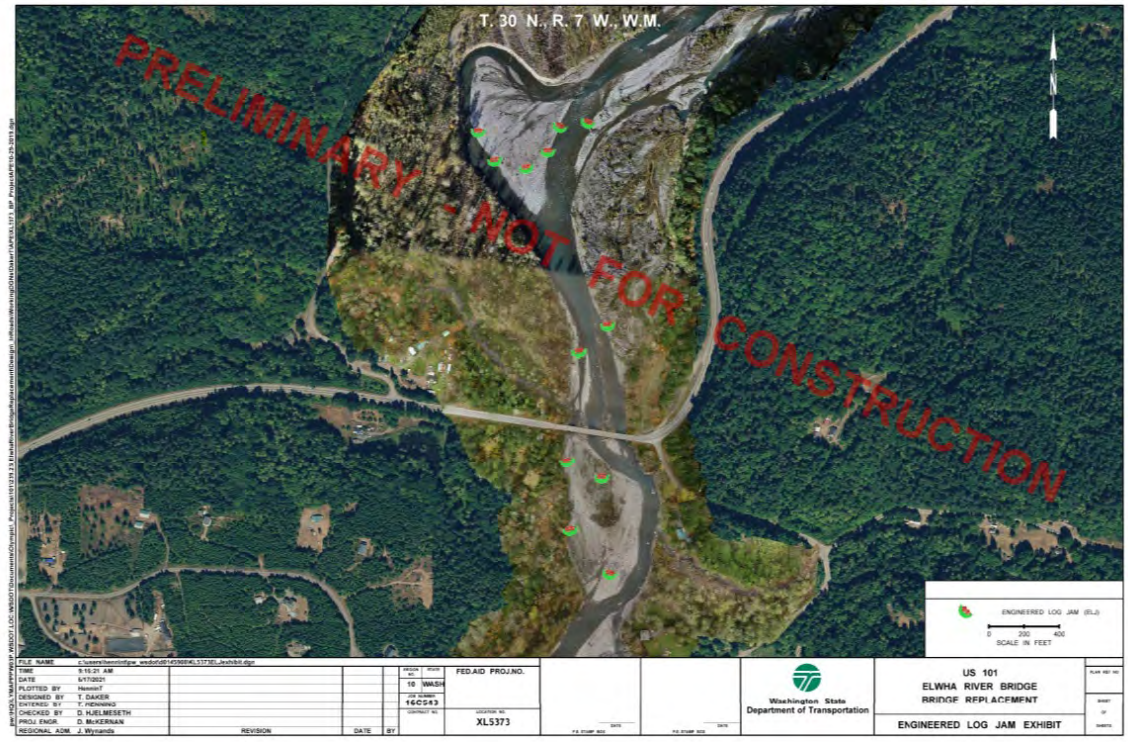


Figure 6. Conceptual Engineered Log Jam Placement

Cumulative effects of the Build Alternative on Fish

The cumulative effects to fish and fish habitat are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on fish and fish habitat. The proposed action would contribute a short-term increment to the cumulative adverse effects during construction activities due to water diversion that may affect natural and ecological processes, sedimentation from

exposed soils, and the potential for spills or leaks from construction equipment. However, with the installment of a stormwater treatment system, the project would add to the long-term beneficial effects. In combination with the impacts of other past, present, and reasonably foreseeable future actions, there would be long-term adverse cumulative effects on fish and fish habitat.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on fish or fish habitat. This alternative would not contribute to the cumulative disturbance of fish or fish habitat when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in short- and long-term, localized, adverse effects on fish and fish habitat. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute incrementally to the short- and long-term, adverse and beneficial cumulative effects on fish and fish habitat.

3.4.6 Wildlife and Wildlife Habitat

Large and small mammals have been observed or are known to occur in the project area. Mammal species include Columbian black-tailed deer (*Odocoileus hemionus columbianus*), Roosevelt elk (*Cervus canadensis roosevelti*), beaver (genus *Castor*), river otter (*Lontra Canadensis*), coyote (*Canis latrans*), bear (*Ursus americanus*), cougar (*Puma concolor*), weasels (genus *Mustela*), mink (*Neovison vison*), and several species of bats. Numerous bird species also use the area, including robins (*Turdus migratorius*), red-tailed hawks (*Buteo jamaicensis*), western flycatchers (*Empidonax difficilis/occidentalis*), ducks, great blue herons (*Ardea Herodias*), hooded mergansers (*Lophodytes cucullatus*), pileated woodpeckers (*Dryocopus pileatus*), gulls (genus *Larus*), cormorants, ruffed (*Bonasa umbellus*) and blue (genus *Dendragapus*) grouse, mountain chickadees (*Poecile gambeli*), great horned owls (*Bubo virginianus*), and western screech owls (*Megascops kennicottii*). Common reptiles in the project area include the northwestern garter snake (*Thamnophis ordinoides*), common garter snake (*Thamnophis sirtalis*), northern alligator lizard (*Elgaria coerulea*), roughskin newts (*Taricha granulosa*), and Pacific chorus frog (*Pseudacris regilla*).

Effects of the No Build Alternative on Wildlife and Wildlife Habitat

Under the No Build Alternative, no action would be taken, therefore, the No Build Alternative would not have any direct adverse or beneficial impacts on wildlife and wildlife habitat within the project area. However, there may be indirect, long-term, beneficial impacts to wildlife and wildlife habitat associated with the eventual closure of the bridge to include reduced noise, visual, and human disturbance in the project area. Traffic along this corridor would be reduced to passenger vehicles accessing the Elwha Valley on the Olympic Hot Springs Road, although the greater volume of traffic noise, to include logging trucks, would be shifted to SRs 112 and 113.

Cumulative effects of the No Build Alternative on Wildlife and Wildlife Habitat

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on wildlife and wildlife habitat. The regular maintenance of, as well as regular commercial and private vehicle use on, US 101 may have resulted in some disturbance to wildlife and would continue to be minimal; geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road may result in impacts to wildlife from noise and increased human presence during construction, and potential habitat loss or degradation in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on wildlife and wildlife habitat as well as overall ecosystem restoration. There would be no additional direct impacts to wildlife or wildlife habitat from the No Build Alternative, though this alternative may have indirect beneficial impacts to wildlife. The indirect beneficial impacts from the No Build Alternative may add a small increment to the beneficial cumulative effect on wildlife or wildlife habitat within the Elwha Valley.

Effects of the Build Alternative on Wildlife and Wildlife Habitat

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would have short-term direct, adverse impacts on wildlife and wildlife habitat during new bridge construction, the removal of the current bridge, and

realignment of the turnoff onto Olympic Hot Springs Road. Wildlife may be disrupted and displaced due to noise generated from the use of heavy equipment, concrete saws, jackhammers, and increased human presence and subsequent conversations occurring over traffic and construction noise. Onsite wildlife habitat would be removed or damaged during construction of the new bridge, demolition of the current bridge, and through the realignment of the highway. There may also be short-term, adverse impacts on wildlife along SRs 112 and 113 as traffic could be diverted to this route until construction is complete, if the current bridge does not remain structurally sound to support vehicle use while the new bridge is being developed.

Mitigation Measures:

Wildlife habitat effected by temporary construction impacts would be restored through native tree and shrub plantings as described in the Vegetation section of this chapter. Portions of the vacated roadway would be similarly restored. Noise abatement that would mitigate impacts to wildlife during project construction is described in the Noise section of this chapter.

Cumulative effects of the Build Alternative on Wildlife and Wildlife Habitat

Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on wildlife and wildlife habitat. The proposed action would contribute short- and long-term increments to the cumulative adverse effects during construction activities due to displacement and disturbance from noise generated from construction equipment and increased human presence or the potential shifting of heavy through-traffic noise to a new route, as well as from habitat damage or removal. Changing river conditions to more natural flows since dam removal have had beneficial impacts on wildlife and wildlife habitat as well as overall ecosystem restoration. In combination with the impacts of other past, present, and reasonably foreseeable future actions, there would be short- and long-term adverse cumulative effects on wildlife and wildlife habitat.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional direct impacts on wildlife or wildlife habitat. This alternative may contribute a small, indirect increment to the beneficial cumulative effect on wildlife or wildlife habitat when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in short- and long-term, localized, adverse effects on wildlife and wildlife habitat. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute a small increment to the short- and long-term, adverse cumulative effects on wildlife and wildlife habitat.

3.4.7 Threatened and Endangered Species

The Endangered Species Act (ESA), NPS *Management Policies 2006*, NEPA, and applicable regulations require the analysis of potential impacts on special-status species (federal or state endangered, threatened, candidate, or species of concern). Such analysis was completed in the project Biological Assessment (WSDOT 2017a). Additionally, according to section 4.4.2.3 of NPS *Management Policies 2006*, NPS must "manage critical habitat […] to maintain and enhance their value of the recovery of threatened and endangered species" (NPS 2006).

This analysis serves as the NEPA assessment of impacts on federally listed species (federal endangered, threatened, or candidate) that could be impacted by bridge construction actions. A biological assessment, as required by section 7 of the ESA, has been completed by WSDOT separate from the NEPA assessment.

The US Fish and Wildlife Service (USFWS) guidance for implementing section 7 consultation under the ESA (USFWS 2017) uses the following terminology to assess impacts on federally listed species:

> ***No Effect.*** 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.

May Affect, but Not Likely to Adversely Affect. 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.

May Affect, Likely to Adversely Affect. 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 USFWS 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.

A section 7 determination of effect summary is included at the end of the analysis for each alternative.

Under the Endangered Species Act, federally listed threatened and endangered species (T&E) and habitat that exist within or immediately adjacent to the project area include bull trout (*Salvelinus confluentus*), Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound steelhead trout (*Oncorhynchus mykiss*), eulachon

(*Thaleichthys pacificus*), northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), streaked horned lark (*Eremophila alpestris strigata*), yellow-billed cuckoo (*Coccyzus americanus*), and Taylor's checkerspot butterfly (*Euphydryas editha taylori*). See Table 1.

There are no known threatened or endangered plants within the immediate vicinity of the project area (WNHP 2017).

Table 1. ESA-Listed Species and Critical Habitat

Species	Status	Federal Jurisdiction	Status of Critical Habitat
Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	NMFS	Designated; none in action area
Puget Sound steelhead trout (*Oncorhynchus mykiss*)	Threatened	NMFS	Designated; present in action area
Eulachon (*Thaleichthys pacificus*)	Threatened	NMFS	Designated; none in action area
Bull trout (*Salvelinus confluentus*)	Threatened	USFWS	Designated; present in action area
Northern spotted owl (*Strix occidentalis caurina*)	Threatened	USFWS	Designated; present in action area
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	USFWS	Designated; present in action area
Streaked horned lark (*Eremophila alpestris strigata*)	Threatened	USFWS	Designated; none in action area
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	USFWS	Designated; none in action area
Taylor's checkerspot butterfly (*Euphydryas editha taylori*)	Threatened	USFWS	Designated; present in action area

Effects of the No Build Alternative on Threatened and Endangered Species

Under the No Build Alternative, no action would be taken, therefore, the No Build Alternative would not have any direct adverse or beneficial impacts on T&E species or their habitat within the project area.

Cumulative effects of the No Build Alternative on Threatened and Endangered Species

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on threatened and endangered species and their habitat. The regular maintenance of, as well as regular commercial and private vehicle use on, US 101 may have resulted in some

disturbance to T&E species and would continue to be minimal; potential geotechnical investigation and rehabilitation or relocation of the Olympic Hot Springs Road may result in impacts to T&E species and habitat from noise and increased human presence during construction, and potential habitat loss or degradation in the foreseeable future; and changing river conditions to more natural flows since dam removal have had beneficial impacts on T&E species and habitat as well as overall ecosystem restoration. There would be no additional direct impacts to T&E species and habitat from the No Build Alternative. The indirect beneficial impacts from the No Build Alternative may add a small increment to the beneficial cumulative effect on T&E species and habitat within the Elwha Valley.

Section 7 Determination Summary

Based on the analysis, the ESA effects determination under the No Build Alternative is no effect on any of the ESA-listed species.

Effects of the Build Alternative on Threatened and Endangered Species

The project ***may affect, is likely to adversely affect*** Chinook salmon, steelhead trout, and bull trout due to the following actions.

- In-channel construction activities are likely to create locally elevated levels of turbidity during construction within 1,500 feet of in-water construction activities.
- The project would result in a new in-water pier configuration; however, the area of benthic displacement would be a net reduction of 1,199 square feet from the baseline condition.
- Temporary in-channel features may create localized increases in stream velocities resulting in localized scour or deposition of streambed materials during construction. The temporary construction access pads could remain in the river for over one year, creating a 160-foot wide channel available for upstream migration through which increased flow velocities would occur.
- Construction activities would be occurring in a reach with documented spawning, potentially temporarily reducing the overall amount of available spawning habitat for Chinook salmon and steelhead trout during construction.

- Dewatering activities would include fish isolation, removal, and handling activities and may affect Chinook salmon, steelhead trout, and bull trout.
- Removal of 2.9 acres of riparian vegetation may indirectly affect habitat functions for Chinook salmon, steelhead trout, and bull trout such as riparian shading of the stream corridors, contributions of invertebrates to the aquatic food chain, and streambank protection.
- Stormwater runoff from roadway surfaces would be discharged to the Elwha River, but would have lower loads and concentrations of pollutants as a result of the project due to increased water quality treatment. Annual copper loads would decrease by 31% for total copper and 19% for dissolved copper. Annual zinc loads would decrease by 33% for total zinc and 23% for dissolved zinc.
- Chinook and steelhead juvenile, and bull trout may be present during installation of cofferdams on the left and right bank for bridge demolition. These cofferdams would isolate a significant area and would require fish removal so that work can occur in the dry.
- Construction activity on and adjacent to gravel bars on the left and right bank may result in localized depressions, which can create ponding features that can pose a stranding risk for Chinook salmon, steelhead trout, and bull trout as river elevations decrease.
- Upstream movements of bull trout may be delayed during peak stream flows due to increase stream velocities during the period when cofferdams are installed for demolition of the existing bridge.

Additionally, while most of the following actions may also affect eulachon, the actions are ***not likely to adversely affect*** eulachon given that they are not expected to occur in the action area which is above the former Elwha Dam.

Critical Habitat

The project ***may affect, is likely to adversely affect*** steelhead and bull trout critical habitat for the following reasons:

- Steelhead and bull trout critical habitat includes the mainstem Elwha River, as well as Indian Creek and Little River that occur within the action area for the project.

- Steelhead freshwater spawning sites may be affected due to turbidity and scour during construction that may affect spawning habitat in the immediate vicinity of the project. These areas may also be temporarily reduced by temporary construction access features, and potentially degraded by fine sediment deposition during in-water construction activities. Freshwater rearing sites may be affected due to increased in-stream turbidity during construction activities. Freshwater migration corridors may be affected due to increased in-stream velocities due to construction access pads and cofferdams installed to isolate demolition areas.
- Juvenile steelhead occurring within the action area may be temporarily displaced or may avoid freshwater rearing habitat near in-water construction.
- The migration of juvenile and adult steelhead may be altered due to the placement of temporary construction access features and increased flow velocities within the project area.
- In-water construction areas would result in alteration of steelhead critical habitat in the area.
- For bull trout, migratory habitat may be affected due to increased in-stream velocities due to construction access pads and cofferdams installed to isolate demolition areas. Also, in-water construction access features would result in alteration of complex river, stream, and reservoir systems and processes in the action area; alterations to water quality and quantity although long-term reductions in the rate of pollutant loading from stormwater are expected to occur; and migration habitat would be altered due to the placement of temporary construction access features and increased flow velocities within the project area.

These factors, when taken together, would likely result in temporary, but unavoidable effects, on one or more steelhead and bull trout primary constituent elements (PCEs).

There would be ***no effect*** on Chinook salmon and eulachon critical habitat as there is no critical habitat for either of these species within the construction limits.

<u>Northern Spotted Owl and Marbled Murrelet</u>

The project ***may affect, is not likely to adversely affect*** northern spotted owls and marbled murrelets for the following reasons:

- While the nearest active spotted owl nesting territory is more than 5 miles from the project site, spotted owls may forage in or disperse through forested habitats near the project site. However, there are no potentially suitable nest trees present within 195 feet of the project site, meaning the potential for adverse effects is discountable. Also, the project site is at a low-elevation (approximately 240 feet), valley-bottom location, whereas sites where spotted owls persist on the Olympic Peninsula are in steep terrain at relatively high elevations (above 2,900 feet, on average). Also, the most suitable nesting habitat on the Olympic Peninsula has been taken over by barred owls, and evidence from monitoring studies suggests that spotted owls are unlikely to recolonize areas of suitable habitat outside of active territories on the Olympic Peninsula. As such, the potential for adverse effects on nesting spotted owls is discountable.
- Marbled murrelets are not known or expected to nest within 328 feet of areas where heavy equipment would be operated. The nearest known nest site is approximately 4.2 miles south of the project site, and all locations where behaviors associated with nesting have been observed are more than 1 mile from the project site. No potentially suitable nest trees are present within 328 feet of areas where heavy equipment would be operated, meaning the potential for adverse effects on nesting murrelets is discountable. Results of surveys conducted in and near the project area indicate that marbled murrelets do not nest in the valley-bottom forest habitat in the project area.
- Forested habitats in the action area could provide suitable nesting/roosting habitat for spotted owls and marbled murrelets. Vegetation clearing for construction activities would remove approximately 3 acres of forest habitat. Also, project-related noise and human activities would cause a temporary increase in the level of disturbance to any spotted owls and marbled murrelets that may be present in the immediate construction area.
- No suitable nesting or roosting habitat for spotted owls would be removed by project activities, and no potentially suitable nest trees for marbled murrelets would be removed either, so project-related impacts on habitat would be insignificant.

Vegetation clearing in the project action area would occur along existing road corridors and would not fragment cover or create new travel corridors for avian predators into suitable nesting, roosting, or foraging habitat for spotted owls or marbled murrelets. For the same reasons, project-related vegetation clearing would not reduce the capacity for forest habitat at the project site to function as dispersal habitat. As such, project-related effects on nesting, roosting, foraging, or dispersal habitat would be insignificant. Any effects that may occur would be minimal in scope and transitory in duration and would have no measurable effect on the long-term survival of northern spotted owls and marbled murrelets.

Critical Habitat

The proposed project would have ***no effect*** on designated critical habitat for northern spotted owls and marbled murrelets. There is no designated critical habitat within or adjacent to (i.e., within 150 feet) the project footprint; therefore, project activities would not affect any of the PCEs of spotted owl or marbled murrelet critical habitat.

Taylor's Checkerspot Butterfly

The project ***may affect, is not likely to adversely affect*** Taylor's checkerspot butterflies for the following reasons:

- Extant populations of Taylor's checkerspot butterflies have been documented approximately 1 mile from the project site, and plant species that may be suitable as hosts for larvae or nectar sources for adults may be present within areas where ground-disturbing activities would occur. However, the project site lacks the features of suitable habitat for Taylor's checkerspot butterflies, so the potential for adverse effects is discountable. Also, no areas with high densities of larval host plants are present at the project site, further reducing the potential for adverse effects on this species.
- Adults are extremely unlikely to venture into the project area because dispersal of adults from occupied habitats occurs only as a random event, limited to few individuals, so the potential for adverse effects on adult butterflies is discountable, any project-related effects would be insignificant.

Critical Habitat

The proposed project would have ***no effect*** on designated critical habitat for Taylor's checkerspot butterflies. There is no designated critical habitat within or adjacent to (i.e., within 150 feet) the project footprint; therefore, project activities would not affect any of the PCEs of critical habitat for the species.

Cumulative effects of the Build Alternative on Threatened and Endangered Species

The cumulative effects to T&E species and habitat are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on T&E species and habitat. The proposed action would contribute short- and long-term increments to the cumulative adverse effects during construction activities due to displacement and disturbance from noise generated from construction equipment and increased human presence or the potential shifting of heavy through-traffic noise to a new route, as well as from habitat damage or removal. There would be long-term beneficial effects to T&E species from the decrease in pollutant loads entering the Elwha River from increased water quality treatment. In combination with the impacts of other past, present, and reasonably foreseeable future actions, there would be short- and long-term adverse cumulative effects on T&E species and habitat.

Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional direct impacts on T&E species and habitat. This alternative may contribute a small, indirect increment to the beneficial cumulative effect on T&E species and habitat when considered with other past, present, and reasonably foreseeable future actions. Implementation of the Build Alternative would result in short- and long-term, localized, adverse and effects on T&E species and habitat. There would be a long-term beneficial effect from improved water quality treatment. The Build Alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would contribute a small increment to the short- and long-term, adverse cumulative effects on T&E species and habitat.

Section 7 Determination Summary
The effects of the Build Alternative on T&E species are presented in Table 2.

Table 2. Effect determinations for Species and Designated Critical Habitat

Species	Status	Federal Jurisdiction	Effect Determination	Critical Habitat Effect Determination
Chinook salmon (Puget Sound ESU)	Threatened	NMFS	Likely to Adversely Affect	No Effect
Steelhead (Puget Sound DPS)	Threatened	NMFS	Likely to Adversely Affect	Likely to Adversely Affect
Eulachon (Southern DPS)	Threatened	NMFS	Not Likely to Adversely Affect	No Effect
Bull trout	Threatened	USFWS	Likely to Adversely Affect	Likely to Adversely Affect
Northern spotted owl	Threatened	USFWS	Not Likely to Adversely Affect	No Effect
Marbled murrelet	Threatened	USFWS	Not Likely to Adversely Affect	No Effect
Streaked horned lark	Threatened	USFWS	No Effect	No Effect
Yellow-billed cuckoo	Threatened	USFWS	No Effect	No Effect
Taylor's checkerspot butterfly	Threatened	USFWS	Not Likely to Adversely Affect	No Effect

ESU = Evolutionarily Significant Unit
DPS = Distinct Population Segment.

3.4.8 Cultural Resources

The US 101 Elwha River Bridge Replacement project is subject to approval by the Federal Highway Administration and as such it must comply with Section 106 of the National Historic Preservation Act, as amended, and the implementing regulations in 36 CFR Part 800. Section 106 requires federal agencies take into account the effects of federally funded or permitted projects on historic properties. A historic property is typically aged 50 years or older, and includes prehistoric or historic districts, sites, buildings, structures, objects, and properties of traditional religious and cultural importance that are listed or are eligible for listing on the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. If historic properties are identified within the APE (see explanation of APE in next paragraph), then potential adverse effects to the historic properties must be assessed, and a resolution of adverse effects recommended.

The procedures under Section 106 require identification of an Area of Potential Effects (APE), identification of any historic properties that may be located within the APE, and evaluation of a project's effects on historic properties. An APE is defined as a geographic

area within which a project may directly or indirectly cause alterations in the character or use of historic properties. The APE includes the planned horizontal and vertical direct impact areas, as well as a one-parcel buffer around the Project footprint on private lands, and a 200-foot buffer around the Project footprint on federal lands in order to account for indirect effects. The project APE is shown in Figure 7.

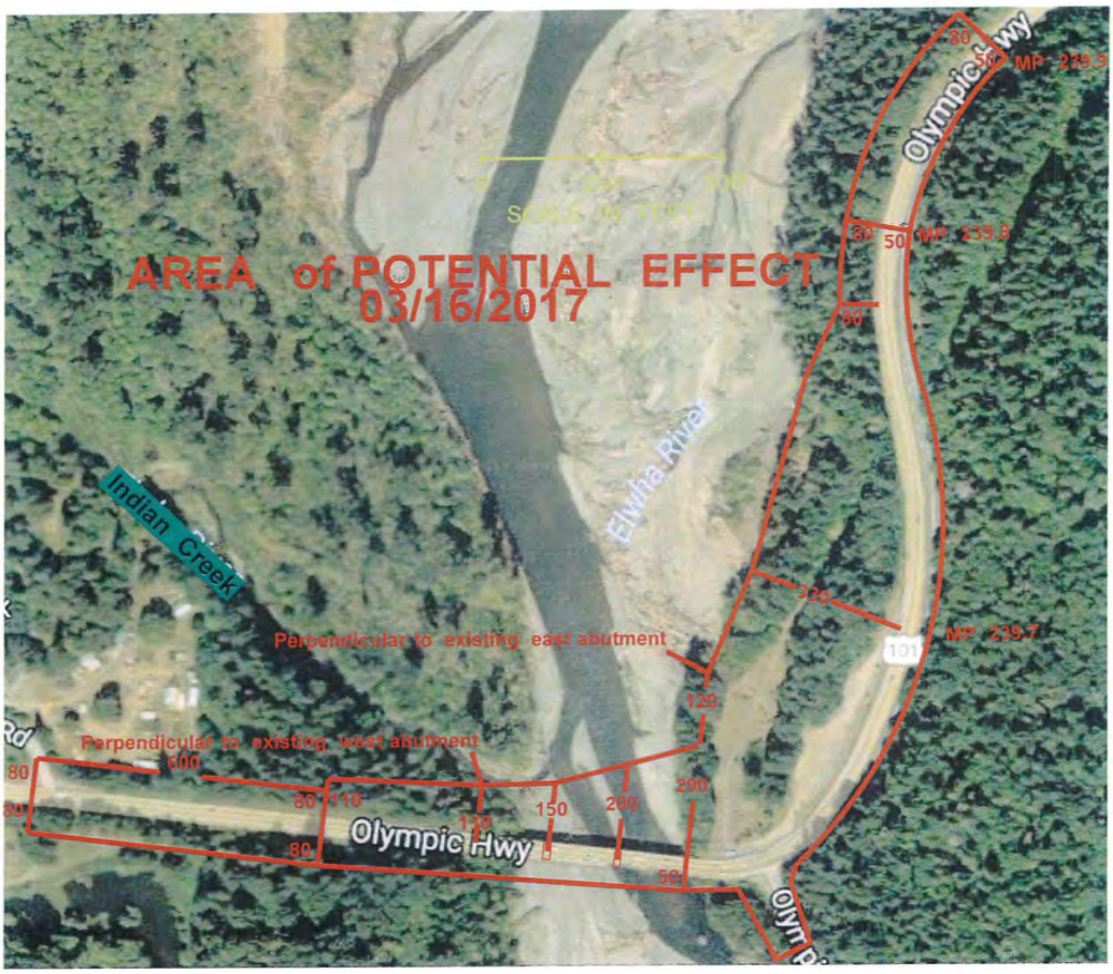


Figure 7. The Project Area of Potential Effect (APE)

The Elwha River Valley is rich in cultural resources that include buildings, structures, landscapes, traditional cultural properties, ethnographic resources, and archeological sites. The valley is the homeland of the Lower Elwha Klallam people, and the river remains at the heart of their ceremonial, cultural, and spiritual existence. Background research and shovel probe survey resulted in the identification of three archeological sites (45CA774, 45CA775, & 45CA727) within the APE. These sites offer substantial research

potential to archaeological understanding of Olcott sites. Archaeological testing of these sites indicates that they contain robust artifact assemblages in high artifact-density areas.

Effects of the No Build Alternative on Cultural Resources

No action would be taken under this alternative, therefore there would be no direct or indirect impacts to cultural resources within the project area.

Cumulative effects of the No Build Alternative on Cultural Resources

Past, present, and reasonably foreseeable future actions, within and outside the project area would continue to contribute short- and long-term, adverse and beneficial impacts on cultural resources. The regular maintenance of US 101 may have resulted in some soil compaction or removal and would continue to be minimal; a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road may result in impacts and compaction in the foreseeable future; and changing river conditions to more natural flows since dam removal have likely had impacts on cultural resources material. There would be no additional impact to cultural resources from the No Build Alternative and it would not add to the overall adverse cumulative effect on cultural resources in the Elwha Valley.

Effects of the Build Alternative on Cultural Resources

The Build Alternative (New Bridge on New Alignment) would result in adverse impacts to all three archeological sites (45CA774, 45CA775, & 45CA727) from construction activities. Impacts to 45CA774 primarily would involve fill 4,000 cubic yards of excavation of the existing roadway fill and 7,200 cubic yards of fill from establishing the new US 101 roadway alignment. Fill activities are proposed in order to achieve slope flattening and thus enhanced public safety along the US 101 transportation facility west of the proposed bridge. A bio swale for stormwater treatment is also proposed in the southeast corner of site 45CA774 resulting in 700 cubic yards of excavation.

Impacts to site 45CA775 would include 100 cubic yards of excavation and 1,900 cubic yards of fill from establishing the new US 101 roadway alignment. There would be 400 cubic yards of excavation and 700 cubic yards of fill resulting from re-establishing required public access north of the highway. There would be 2,000 cubic yards of

excavation and 800 cubic yards of fill resulting from re-establishing a required public parking area. There would be 100 cubic yards of excavation and 1,500 cubic yards of fill resulting from the re-aligned Olympic Hot Springs Road.

Impacts to 45CA727 would include 1,900 cubic yards of fill resulting from river access installation to construct the bridge and remove existing structures.

Cumulative effects of the Build Alternative on Cultural Resources

The cumulative effects to cultural resources are similar to those described in the No Build Alternative. Past, present, and reasonably foreseeable future actions within and outside the project area would continue to contribute short- and long-term, adverse and potentially beneficial impacts on cultural resources. The proposed action would contribute in the short and long-term to cumulative effects on cultural resources. The contributing impacts result in the construction impacts described above, including the removal of sediment. In combination with the impacts of other past, present, and reasonably foreseeable future actions, there would be short- and long-term adverse cumulative effects on cultural resources.

Mitigation and Conclusion

No action would be taken under the No Build Alternative; therefore there would be no additional impacts on cultural resources. This alternative would not contribute to the cumulative disturbance of cultural resources when considered with other past, present, and reasonably foreseeable future actions. WSDOT is currently undergoing Section 106 consultation with the LEKT and Department of Archeology and Historic Preservation (DAHP) to address adverse effects from implementation of the Build Alternative and appropriate mitigation measures are documented in a Memorandum of Agreement (MOA) (Appendix G) . A record of tribal correspondence is included in Appendix E.

3.4.9 Acoustic Environment

The acoustic environment is a resource with intrinsic natural and cultural resources value. It is a critical component of wilderness character and plays an important role in wildlife communication, behavior, and other ecological processes. Results from surveys of the

American public indicate that hearing the sounds of nature is an important reason for visiting national parks. Therefore, the value of acoustic environments and soundscapes is related to an array of park resources and has broad implications for park management. As described in the park's GMP, natural sounds characterize the park — the impossibly elaborate song of a winter wren, bugling bull elk declaring their dominance, the rhythm of waves over pebbles on a beach, the piercing whistle of an Olympic marmot, the crisp sound of wind through subalpine fir, the soft silence of falling snow, and the haunting flute-like call of a varied thrush. Even if the source is impossible to find, sounds inform visitors of what is around them (NPS 2008).

Some threats to the acoustic environment originate in areas adjacent to the park boundaries such as noise from logging or adjacent construction activities, National Park Service project related aircraft, and non-National Park Service aircraft such as military, commercial, and private sector aircraft (NPS 2008).

The project area is located within the heavily traveled corridor of US 101. This corridor is a through route, the road serves not only park visitors, but also commercial users (including heavy logging truck traffic), and local commuter and non-commuter traffic. There has not been a sounds study specifically for this project area. There has been a sounds study of the 12-mile section of US 101 within the NPS boundary along Lake Crescent. Some data from that study is relevant to this project site as the traffic that passes through the Lake Crescent section of the highway also passes through this project area. That study, conducted by the National Park Service's Natural Sounds and Night Skies Division (NSNSD) revealed that approximately 25% of the 4,000 vehicles per day is estimated to be attributed to heavy truck traffic, primarily from logging trucks (NPS 2015). Based on experience of the project team, standing in the project area observing bridge and landscape characteristics, when logging trucks passed, typically all conversation had to cease before, during, and after passage, so that the continued conversation could be heard. At the project site, some of the road noise is masked (and added to) by the river noise, creating a louder overall ambient acoustic environment with both natural and human-caused components.

According to the NSNSD snapshot, park transportation corridors, like the one surveyed in the US 101 at Lake Crescent study, have median ambient sound levels that are typically more than four orders of magnitude higher than the natural condition (NPS 2015). As with other roads studied, traffic along this corridor also follows a pattern. Traffic is generally heavier on this stretch of highway during the summer compared to winter and is heavier during the daytime compared to nighttime (NPS 2015). Weather patterns also influence the distribution of sound near the roadway, with wetter periods experiencing more sounds and louder decibel levels than dry periods due to rain, thunder, presence of wildlife, and other natural sounds.

Effects of the No Build Alternative on the Acoustic Environment

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound and unsafe for vehicle use. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, the No Build Alternative would not have any direct adverse or beneficial impacts on the acoustic environment within the project area. However, indirect, long-term, beneficial and adverse impacts associated with the eventual closure of the bridge include an improvement in the acoustic environment in the project area given that traffic along this corridor would be reduced to passenger vehicles accessing the Elwha Valley on the Olympic Hot Springs Road, although the greater volume of traffic noise, to include logging trucks, would be shifted to SRs 112 and 113.

Cumulative effects of the No Build Alternative on the Acoustic Environment

Past, present, and reasonably foreseeable future actions with the potential to impact the acoustic environment include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road, and former blasting and other activities that occurred during the removal of the Elwha and Glines Canyon Dams. Other actions in the area that currently impact or could impact the acoustic environment include military, commercial, and private overflights.

Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on acoustic resources. The No Build Alternative would add greater short-term beneficial effects due to reduced traffic noise once the bridge is deemed no longer safe for vehicle use. However, this would lead to long-term adverse effects due to the shift of traffic volume from US 101 to SRs 112 and 113. When the incremental impacts of the No Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on the acoustic environment would be adverse. The effects of the No Build Alternative would slightly add to the overall cumulative impacts because, while traffic noise would be reduced within the project area by the eventual bridge closure and traffic reroute, the noise impacts from the heavy through-traffic would shift to the new route.

Effects of the Build Alternative on the Acoustic Environment

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would have short-term direct, adverse impacts on the acoustic environment during new bridge construction, the removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. These impacts would be due to the use of heavy equipment, concrete saws, jackhammers, and other noise-producing construction equipment, and increased human presence and subsequent conversations occurring over traffic and construction noise. There may also be short-term adverse impacts on the acoustic environment along SRs 112 and 113 as traffic may be diverted to this route until construction is complete, if the current bridge does not remain structurally sound and safe for vehicle use while the new bridge is being developed. Additional, WSDOT specific, impact analysis on the acoustic environment is as follows.

Short-term Effects (Construction Noise): Construction creates temporary noise. Construction is usually carried out in reasonably discrete steps, each with its own mix of equipment and noise characteristics. The most constant noise source at construction sites is usually engine noise. Mobile equipment generally operates intermittently or in cycles of operation, while stationary equipment, such as generators and compressors, generally operate at fairly constant sound levels. Trucks are present during most phases of

construction and are not confined to the project site, so noise from trucks, including back-up alarms, may affect more receivers than other construction noise. Other common noise sources include impact equipment, which could be pneumatic, hydraulic, or electric powered.

Construction noise was not assessed quantitatively because the project is exempt from Department of Ecology property line noise level limits during daytime hours. The following sections discuss noise variances that would be required for nighttime work, typical construction equipment noise levels, and abatement measures.

If nighttime construction is required for this project, WSDOT would apply for variances or exemptions from local noise ordinances for the night work. Noise variances or exemptions require construction noise abatement measures that vary by jurisdiction. Construction noise can be reduced by using enclosures or walls to surround noisy equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment farther away from noise sensitive receivers, e.g., homes.

To reduce construction noise at nearby receptors, the following abatement measures can be incorporated into construction plans and contractor specifications:

- Limiting construction activities to between 7 a.m. and 10 p.m. would reduce construction noise levels during sensitive nighttime hours
- Using haul vehicles with rubber bed-liners would reduce noise from loading trucks
- Equipping trucks with ambient backup alarms would reduce the noise for equipment backing
- Equipping construction equipment engines with adequate mufflers, intake silencers, and engine enclosures would reduce their noise by 5 to 10 dBA
- Constructing temporary noise barriers or curtains around stationary equipment that must be located close to residences would decrease noise levels at nearby sensitive receptors

Additional methods for reducing construction noise levels that may be incorporated by the project engineering office or required by a jurisdiction include the following:

- Specifying the quietest equipment available would reduce noise by 5 to 10 dBA
- Turning off construction equipment during prolonged periods of non-use would eliminate noise from construction equipment during those periods
- Requiring contractors to maintain all equipment and train their equipment operators would reduce noise levels and increase efficiency of operations
- Locating stationary equipment away from receiving properties would decrease noise from that equipment in relation to the increased distance

Long-term Effects (Traffic Noise): For WSDOT projects that use FHWA funding, WSDOT is required to follow standard practices to evaluate noise impacts near proposed projects. Any applicable area predicted to have a future traffic noise level of 66 dBA or greater qualifies as an impacted area. Research shows that above 66 dBA, a conversation between two people standing three feet apart and speaking in a normal voice is impaired.

Using the FHWA Traffic Noise Model (TNM) version 2.5, WSDOT employed a 'straight line model' to estimate whether the project would generate traffic noise impacts. The model indicates that traffic noise impacts were modeled out to a distance of 100 feet from the US 101 centerline of the roadway at the 66 dBA Noise Abatement Criteria (NAC) threshold. Noise impacts for the existing year stop at 101 feet from the centerline of the roadway. For the future design year noise impacts stop at 116 feet from the centerline of the roadway.

In the existing year there are no noise sensitive receivers, however in the design year there will be a trail that runs perpendicular to and under the new bridge, which would put it within the noise impact zone. However, because the bridge would be elevated 13 feet above the trail, it is assumed that there would be partial shielding of the traffic noise from the bridge resulting in at least a three decibel noise reduction to the trail. Therefore, no noise impacts are anticipated on the trail. Table 3 shows the predicted noise levels at the receiver location.

Table 3. Predicted Noise Levels (LAeq)

Receiver distance (feet)	Receiver Location	Noise Levels 2017 (dBA)	Noise Levels 2040 Without Wall (dBA)
100	Trail	**66**	**67**
150	Trail	62	63

Bold numbers indicate impacts

Cumulative effects of the Build Alternative on the Acoustic Environment

Past, present, and reasonably foreseeable future actions with the potential to impact the acoustic environment include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road, and former blasting and other activities that occurred during the removal of the Elwha and Glines Canyon Dams. Other actions in the area that currently impact or could impact the acoustic environment include military, commercial, and private overflights.

Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on the acoustic environment. The Build Alternative would have short-term adverse effects because of noise produced during construction of the new bridge, removal of the current bridge, realignment of US 101 at the turn-off for Olympic Hot Springs Road, and the potential need to divert traffic to SRs 112 and 113 during construction if the current bridge does not remain structurally sound for vehicle use. When the incremental impacts of the Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on the acoustic environment would be adverse. The effects of the Build Alternative would add to the overall cumulative impacts due to the noise that would be generated during bridge construction, removal of the current bridge, US 101 realignment, as well as to the potential traffic diversion shifting heavy through-traffic noise to a new route, creating greater noise impacts along that route.

Conclusion

Under the No Build Alternative, the bridge would eventually need to be closed which would divert traffic onto another through-route. This would have both adverse and beneficial impacts on the acoustic environment. Past, present, and reasonably foreseeable future actions such as US 101 rehabilitation at Lake Crescent, regular maintenance of US 101, a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road, former blasting and other activities that occurred during the removal of the Elwha and Glines Canyon Dams, and overflights would contribute adverse cumulative impacts. Overall cumulative impacts on the acoustic environment under the No Build Alternative would be adverse. The effects of the No Build Alternative would add a short- and long-term, adverse increment to the overall cumulative impacts mainly due to the traffic diversion shifting the heavy through-traffic noise to a new route, creating greater noise impacts along that route.

Under the Build Alternative, a new bridge would be constructed, the current bridge would be removed, and US 101 would be realigned at the turn-off for Olympic Hot Springs Road. These actions would have short-term adverse impacts on the acoustic environment. Past, present, and reasonably foreseeable future actions such as US 101 rehabilitation at Lake Crescent, regular maintenance of US 101, a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road, former blasting and other activities that occurred during the removal of the Elwha and Glines Canyon Dams, and overflights would contribute adverse cumulative impacts. Overall cumulative impacts on the acoustic environment under the Build Alternative would be adverse. The effects of the Build Alternative would add a short-term adverse increment to the overall cumulative impacts mainly due to noise created during construction of the new bridge, removal of the current bridge, road realignment, and the potential diversion of heavy through-traffic to SRs 112 and 113.

3.4.10 Social and Environmental Justice

Presidential Executive Order 12898 ((1994) provides that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing,

as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minorities and low-income populations." USDOT and FHWA also have orders (FHWA 2012 and 2012a) that require consideration of human health and environmental effects related to projects that may have a disproportionately high and adverse effect on minority and low-income populations. Also required are procedures to provide "meaningful opportunities for public involvement" by members of these populations during project planning and development (FHWA 2012).

Potential social, economic, and environmental justice effects of projects often extend beyond their physical limits. A study area extending a half mile in all directions from the project includes school districts, neighborhoods, and rural areas along US 101 near the Elwha River Bridge. This study area includes areas that may have noise, visual, and traffic effects. Relevant data from the U.S. Census and local school district are presented below.

Table 4 summarizes 2010 census data for the area within a half mile of each side of the centerline of the project. The data presented do not indicate that there are populations present that meet environmental justice criteria. The census data may not have captured the potentially affected communities for a variety of reasons. They may not have been living there at the time of census, they may not have received or completed the census questionnaire, or there may be other reasons they were not included.

Table 4. Minority and Elderly Populations within a half mile of the project area

Minority	Number of persons	Percentage
White	37	93
Hispanic or Latino (of any race)*	1	1
American Indian and Alaskan Native*	1	1
Black or African American*	0	0
Asian*	0	0
Native Hawaiian and Other Pacific Islander*	0	0
Population Reporting Two or More Races*	1	1
Overall % Minority*	2	8
Total population in the study area	40	100
Low Income**	1	11
Speaks English less than well**	0	0

*Source: the Environmental Justice Screen Census 2010 Summary Report (EPA 2018), collected within ½ mile of the study area

The closest elementary school is Dry Creek Elementary School. School demographic data is summarized in Table 5. "American Indian and Alaskan Native" comprises over 20% of the school enrollment. Free or reduced meals are provided to 67% of children at the school. These data suggest that protected environmental justice populations are present within a few miles of the project. The school itself is located about five miles to the north of the project with a service area that is large and mostly distant from the project. The school service area includes parts of Port Angeles, a population center which is located several miles to the northeast of project activities. There appear to be no population centers west of the Elwha River. This environmental justice analysis was conducted in accordance with ONP, WSDOT, and FHWA guidance and procedures.

Table 5. Dry Creek Elementary School Demographic Data

	Enrollment	Percentage %
White	209	56.5
Hispanic or Latino	21	5.7
American Indian and Alaskan Native	76	20.5
Black or African American	0	0
Asian	1	0.3
Native Hawaiian and Other Pacific Islander	0	0
Two or More Races	63	17
Free or Reduced – Price Meal Partition	257	67.6
Transitional Bilingual Education	3	0.8

Source: Washington State Office of Public Instruction Washington State Report Card website.

Effects of the No Build Alternative on Environmental Justice Populations

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound and is unsafe for vehicle traffic. No efforts would be undertaken to fix, reconstruct, or remove the bridge. No minority or low-income populations have been identified that would be adversely affected by the No Build Alternative.

Cumulative effects of the No Build Alternative on Environmental Justice Populations

Past, present, and reasonably foreseeable future actions with the potential to impact Environmental Justice populations include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. No minority or low-income

populations have been identified that would be adversely affected by this or the above projects. The effects of the No Build Alternative would not contribute to cumulative effect on Environmental Justice populations.

Effects of the Build Alternative on Environmental Justice Populations

This project is located in a rural area with large land parcels and few residents. The alignment of the replacement bridge would be slightly downriver of the existing bridge and angled differently relative to the river, to allow reconfiguration of the curve in US 101 at the eastern approach to the bridge. The new alignment would require no relocations. To the west of the new bridge, the project alignment would tie back into the existing highway east of Lake Aldwell Road thus negating any direct impacts to residents that use that local road for highway access. During construction of the new bridge, traffic would continue to use the existing US 101 Elwha River Bridge for east and west movement along the highway. During construction of the US 101 Olympic Hot Springs Road intersection, the intersection would be closed and detour provided. Trips between locations south on Olympic Hot Springs Road and Port Angeles would take about 6 minutes longer on a Little River Road / Black Diamond Road detour. No new capacity would be added to US 101 so traffic and air quality would not be affected. Vertical and horizontal shifts of the highway would be minor and do not require quantitative noise analysis. Noise impacts and visual impacts would be negligible. A more detailed discussion of noise, visual effects, and traffic is presented in this chapter under the respective heading for each of these disciplines.

Cumulative effects of the Build Alternative on Environmental Justice Populations

Past, present, and reasonably foreseeable future actions with the potential to impact Environmental Justice populations include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. No minority or low-income populations have been identified that would be adversely affected by this or the above projects. The effects of the No Build Alternative would not contribute to cumulative effects on Environmental Justice populations.

Conclusion

Past, present, and reasonably foreseeable future actions would not contribute to adverse cumulative impacts. No minority or low-income populations have been identified that would be adversely affected by this project under either alternative. Therefore, both alternatives have met the provisions of Executive Order 12898, as it is supported by Title VI of the Civil Rights Act.

3.4.11 Transportation

US 101 is the main artery for travel between the eastern and western sides of the Olympic Peninsula. The highway extends from southern California to the Olympic Peninsula. The highway passes through ONP along Lake Crescent and provides access to some of the more popular and heavily visited areas in the park and on the Olympic Peninsula. In 2010, the annual traffic count for this route was 465,000 vehicles, based on a counter located at the east end of Lake Crescent that captured westbound traffic. Peak traffic reaching 70,000 per month occurs between June and September. Part of US 101 around the Olympic Peninsula (from Olympia to near Ilwaco -- Chinook) has been designated as part of the Pacific Coast National Scenic Byway by the FHWA, and the segment along the Lake Crescent shoreline is considered among the most scenic segments on the byway. Additionally, the alternate route between Port Angeles and Forks is State Routes (SR or SRs) 112 and 113. SR 112 between Port Angeles and the Makah Indian Reservation is designated as the Strait of Juan de Fuca Scenic Byway.

Since US 101 is a through route, the road serves not only park visitors, but also commercial users, and local commuter and non-commuter traffic. This route serves as the only access to the south side of Lake Crescent, including park-related facilities at either end. There is no feasible alternative route to access the facilities on the south side of Lake Crescent; however there is an alternate route (SRs 112 and 113) around the lake that has previously been used when the road has been closed.

Effects of the No Build Alternative on Transportation

Under the No Build Alternative, no replacement bridge would be constructed. If the river flows exceed 22,000 cfs or the tilt meter has a sustained reading of more than 4.5mm,

WSDOT maintenance would close the bridge to traffic within a 15 minute time-period, establish flagging operations, and make several sequential emergency phone calls. Barriers to close off the bridge would be established, existing detour signing would be uncovered, and VMS board operation would be verified. For short-term or permanent bridge closure, drivers would be required to detour onto State Routes 112 and 113. Since the US 101 Elwha River Bridge is the most efficient link for all users of the highway system the detours would result in adverse transportation impacts to the public and surrounding communities. Detours would also adversely affect peninsula commerce including freight, timber, and special forest industry. This alternative would not achieve the need and purpose as described in Chapter 1 of this document.

Cumulative effects of the No Build Alternative on Transportation

Past, present, and reasonably foreseeable future actions with the potential to impact transportation include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. Overall, past, present, and reasonably foreseeable future actions involve short-term adverse effects but long-term benefits on transportation. The No Build Alternative would add a short- and/or long-term adverse effect due to the potential for bridge closures. When the potential impacts of the No Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on public use would be adverse. The effects of the No Build Alternative would greatly add to the overall transportation impacts on transportation because of the affects noted in the above section.

Effects of the Build Alternative on Transportation

During the first construction year, US 101 would continue utilizing the route over the existing Elwha River Bridge, thereby providing uninterrupted service to commerce and the public as construction of the new bridge progresses along a separate alignment. Any impacts to the public are expected to be minimal, with expectations of short-term (15 minutes or less) flagger controlled delays for delivery of equipment and materials.

Once the bridge superstructure (including barrier, rail, and approach slabs followed by paving of the new alignment) is complete, US 101 through traffic would be shifted onto the new alignment. Access to Olympic Hot Springs Road would be rerouted via the old existing bridge thereby allowing construction of the new US 101/Olympic Hot Springs Road intersection. Upon completion of the intersection, the existing bridge would permanently close. Bridge demolition work would begin coinciding with the approved in-water work window. The Build Alternative would have short-term, direct, adverse impacts on transportation during new bridge construction, and long-term beneficial affects due to increased safety, reliability, and expected longevity of the new transportation facility.

Beneficial effects of the Build Alternative include eliminating a dangerous curve in the highway east of the river crossing and establishing a new bridge with 12-foot lanes founded in bedrock, meeting current seismic requirements. Beneficial improvements for pedestrians and bicyclists would include 8-foot shoulders across the new bridge. Transit users would have formal bus stops at each end of the bridge. Additional benefits would also include providing informal river access parking along the east bank of the Elwha River between Olympic Hot Springs Road and US 101, similar to existing conditions.

Cumulative effects of the Build Alternative on Transportation

Past, present, and reasonably foreseeable future actions with the potential to impact transportation include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. The Build Alternative would have short-term, direct, adverse effects on transportation during the construction phases, but long-term beneficial transportation effects due to the increased safety, reliability, and expected longevity of the new bridge.

Conclusion

The No Build Alternative would potentially have adverse impacts on transportation because bridge closures may need to be implemented. Past, present, and reasonably foreseeable future actions would include a mix of adverse and beneficial effects to

transportation. The No Build Alternative would add greatly to a short- and/or long-term adverse increment to the overall cumulative transportation impacts due to the possibility of bridge closures. Under the Build Alternative, a new bridge would be constructed, the current bridge would be removed, and US 101 would be realigned at the turn-off for Olympic Hot Springs Road. These actions would have short-term adverse impacts but long-term benefits. The effects of the Build Alternative would add a slight short-term beneficial increment to the overall beneficial cumulative impacts due to the increased safety, reliability, and expected longevity of the new transportation facility.

3.4.12 Land Use

The current project occurs almost entirely within what are currently designated as the Elwha Project Lands, managed by the National Park Service. Also in the general vicinity of the project are sparse, privately owned residential properties. In October 1992, the Elwha River Ecosystem and Fisheries Restoration Act (the Act) (see Appendix A) was signed into law. The Act authorized the Secretary of the Interior to acquire the Elwha Hydroelectric Project. The Elwha Project Lands, including the Elwha Resort (which was a lease on the private lands), were part of the Elwha Hydroelectric Project. The hydroelectric project was purchased by the NPS in March 2000 and the park inherited the Elwha Resort lease at that time. The NPS is the interim manager of the project lands until a long-term land manager is identified. The Elwha Project Lands have been impacted by commercial and visitor use.

The Elwha Resort was a former commercial site that was established in the 1920s. Resort facilities included a gas station, cabins, office, grocery store, café, shop, laundry/toilet, a mobile home, waterside barbeque shelter and boat launch, and a picnic area. The area was graveled and contained spaces for travel-trailers. The resort also provided a rafting service. The resort was used seasonally by vacationing families and sportsmen. In the off-season, the cabins were used as temporary rental units for transient and local citizens. There used to be an unimproved boat launch that was never managed by the NPS and there have always been unimproved fishermen trails along the shoreline, though the river has moved away from the old shoreline following the draining of Lake Aldwell. The

resort closed in 2000. The "Elwha Resort Historic District" was determined eligible and nominated for listing on the National Register of Historic Places in 2001, however the main building (store and café) was burned down (suspected arson) later that same year. This area is now an unrestored commercial site with all facilities removed, including the campsites. The site has experienced public dumping as well as poaching of trees for firewood. Visitors and local residents still park there and access the river from this location. Additionally, Clallam County Public Utilities District (PUD) maintains a power line through the project area.

Effects of the No Build Alternative on Land Use

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound and is unsafe for vehicle traffic. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Public access would continue to be allowed and there would be no changes to the use of the NPS Elwha Project Lands. Therefore, the No Build Alternative would not have any direct adverse or beneficial impacts on land use within the project area.

Cumulative effects of the No Build Alternative on Land Use

Past, present, and reasonably foreseeable future actions with the potential to impact land use include a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on land use. The No Build Alternative would not add any beneficial or adverse effects. When the impacts of the No Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on public use would be adverse. The effects of the No Build Alternative would not add to the overall cumulative impacts on land use because no actions would be taken under this alternative that would affect land use.

Effects of the Build Alternative on Land Use

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, US 101 would be realigned at the turnoff for Olympic Hot Springs Road. The Build Alternative would not have notable impacts on land use due to new bridge

construction, the removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. There would not be notable changes in land use within the project area. The NPS would still be the interim manager of these lands until a long-term land manager is identified. WSDOT would maintain a right-of-way under an HED provided by the NPS.

Cumulative effects of the Build Alternative on Land Use

Past, present, and reasonably foreseeable future actions with the potential to impact land use include a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on land use. The Build Alternative would have long-term, direct, adverse effects on land use due to changes in current land use within the project area. When the impacts of the Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on land use would be adverse. The effects of the Build Alternative would add a slight increment to the overall adverse cumulative impacts on land use.

Conclusion

Under the No Build Alternative, no actions would occur that would have any effect on land use. Past, present, and reasonably foreseeable future actions such a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would contribute minimal adverse cumulative impacts. Overall cumulative impacts on land use under the No Build Alternative would be adverse. The effects of the No Build Alternative would not add any additional beneficial or adverse cumulative impacts. Under the Build Alternative, a new bridge would be constructed, the current bridge would be removed, and US 101 would be realigned at the turn-off for Olympic Hot Springs Road. These actions would have long-term adverse impacts on land use. Past, present, and reasonably foreseeable future actions such as a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would contribute adverse cumulative impacts to land use. Overall cumulative impacts on land use under the Build Alternative would be adverse. The effects of the Build Alternative

would add a long-term adverse increment to the overall adverse cumulative impacts mainly due to changes in current land use within the project area.

3.4.13 Public Access

A study has not been conducted for the project area to determine the level and type of use that occurs here. Visitors and local residents access the Elwha River from this location. Vehicles pull off of US 101, park in the dirt and gravel space adjacent to the highway, and walk down to the river. There are currently no formalized or maintained facilities in this area including the parking area, trails, and boat launch. However, visitors and local residents use this area for walking alongside the river; and as a non-commercial kayak, tubing, or rafting put-in or take-out location. The Elwha River has been closed to all fishing since 2012 and will remain closed to fishing at least through July 2021.

Effects of the No Build Alternative on Public Access

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound and is unsafe for vehicle traffic. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Public access would continue to be allowed. Therefore, the No Build Alternative would not have any direct adverse or beneficial impacts on public access within the project area. However, indirect, short- or long-term, adverse impacts on public access are associated with benign neglect of the bridge. Closures to public use on the river immediately underneath and adjacent to the bridge, due to unsafe passage under the bridge, may need to be implemented.

Cumulative effects of the No Build Alternative on Public Access

Past, present, and reasonably foreseeable future actions with the potential to impact public access include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road. Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on public access to the Elwha Valley. The No Build Alternative would add a short- or long-term adverse effect due to the potential for closures to public use on the river immediately underneath and adjacent to the bridge. When the impacts of the No Build Alternative are added to the impacts of

other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on public use would be adverse. The effects of the No Build Alternative would slightly add to the overall cumulative impacts on public use because closures to public use on the river immediately underneath and adjacent to the bridge, due to unsafe passage under the bridge, may need to be implemented.

Effects of the Build Alternative on Public Access

Under the Build Alternative, the bridge would be reconstructed adjacent to its current location. Also, Olympic Hot Springs Road would be realigned at the new intersection with US 101 to intersect with the new highway alignment. The Build Alternative would have short-term, direct, adverse impacts on public access during construction of the new bridge, the removal of the current bridge, and realignment of the intersection with Olympic Hot Springs Road. This would be due to the need to temporarily restrict public parking and pedestrian access to the river and the bank immediately under and adjacent to the bridge and construction zone during construction activities for public safety. Following construction, parking and pedestrian access to the river would return to similar to pre-project conditions. The somewhat longer term effects of the Build Alternative would be neutral. The Build Alternative maintains the current level of river access and parking with a different configuration due to the new bridge alignment and approach. While there is public interest in improving public access to the river at this location, public access improvements are not within the scope of this bridge replacement project. Figure 8 shows the proposed parking area and access trail.

Figure 8. Project Map with Proposed Informal Parking Area

Cumulative effects of the Build Alternative on Public Access

Past, present, and reasonably foreseeable future actions with the potential to impact public access include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road.

Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on public access. The Build Alternative would have short-term, direct, adverse effects on public access during new bridge construction, the removal of the current bridge, and realignment of the turnoff onto Olympic Hot Springs Road. This would be due to the need to restrict public access on the river and the bank immediately under and adjacent to the bridge and construction area during construction activities due to public safety. When the incremental impacts of the Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall adverse cumulative impacts on public use would be adverse. The effects of the Build Alternative would add a slight increment to the overall adverse cumulative impacts on public use.

Conclusion

Under the No Build Alternative, closures to public use on the river immediately underneath and adjacent to the bridge, due to unsafe passage under the bridge, may need to be implemented. Past, present, and reasonably foreseeable future actions such as US 101 rehabilitation at Lake Crescent, regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would contribute adverse cumulative impacts. Overall cumulative impacts on public use under the No Build Alternative would be adverse. The effects of the No Build Alternative would slightly add a short- or long-term adverse increment to the overall cumulative impacts mainly due to a potential need for closures to public use on the river under and adjacent to the bridge due to unsafe passage under the bridge. Under the Build Alternative, a new bridge would be constructed, the current bridge would be removed, and US 101 would be realigned at the turn-off for Olympic Hot Springs Road. These actions would have short-term adverse impacts on public use. Past, present, and reasonably foreseeable future actions such as US 101 rehabilitation at Lake Crescent, regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road would contribute adverse cumulative impacts. Overall cumulative impacts on public use under the Build Alternative would be adverse. The effects of the Build Alternative would add a slight short-term adverse increment to the overall adverse cumulative impacts mainly due to the

need to restrict public access on the river and the bank immediately under and adjacent to the bridge and construction area during construction activities due to public safety.

3.4.14 Visual Quality

US 101 through the project area is part of the Pacific Coast Scenic Byway which begins in Olympia, Washington and loops around the Olympic Peninsula. The Scenic Byway is a draw unto itself, and also serves as the main artery for travel between the eastern and western sides of the Olympic Peninsula. The highway passes through ONP along Lake Crescent and provides access to some of the more popular and heavily visited areas in the park and on the Olympic Peninsula. A portion of US 101 around the Olympic Peninsula has been designated as part of the Pacific Coast National Scenic Byway by the FHWA, and the segment along the Lake Crescent shoreline is considered among the most scenic segments on the byway. The roadside character of the area is heavily forested with native vegetation in a rolling, mountain foothill terrain. Views tend to be intact with few encroachments.

Visual quality is defined by the FHWA as the result of the interactive experience between viewers and their environment. While viewers may have different opinions on a given view within the purview of a transportation project, FHWA considers that the reason a viewer is in the area has a direct link to how they perceive that view. FHWA maintains that the viewer's self-interest can be used to predict what viewers would and would not enjoy viewing. The entire project area is located within a Scenic Byway and a mature forest. Most viewers can therefore be expected to prefer a forested view, having travelled to the area for this reason. Exceptions exist of course, but in general, it can be assumed that a forested view would be the preferred view. Areas where the forested view is blocked by constructed elements, road signs, light standards or other encroachments can be expected to be less visually valued than unobstructed views. Views where the natural appearance of the land has been disturbed, soils bared, and trees removed, can also be expected to be lower in visual quality. Overall, visual quality within the project limits is a river valley within a mature forest with few encroachments and likely to be perceived as high. Viewer sensitivity is moderate as most of the viewers use US 101 as a travel route.

Effects of the No Build Alternative on Visual Resources

Under the No Build Alternative, the bridge would remain open until monitoring shows it is no longer structurally sound and is unsafe for vehicle traffic. No efforts would be undertaken to fix, reconstruct, or remove the bridge. Therefore, this alternative would not alter the existing visual quality of the project area in the short-term. In the long term, the existing US 101 Elwha River Bridge would eventually become unusable and traffic would be diverted as described under the Transportation section above. This would result in an adverse effect on visual quality because the integrity of the Pacific Coast Scenic Byway would be interrupted with detours utilizing SRs 112 and 113.

Cumulative effects of the No Build Alternative on Visual Resources

When the incremental impacts of the No Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on visual quality would be adverse. In the long-term, the US 101 Elwha River Bridge would become unusable and views enjoyed along the Pacific Coast Scenic Byway would be interrupted with detours into other areas.

Effects of the Build Alternative on Visual Resources

Short-term effects:

Construction activities typically detract from visual quality because construction sites are usually dynamic and active. For this project, new bridge construction would occur alongside the existing roadway. Construction would include clearing and grading. Large construction equipment and construction staging areas would likely be in use and visible from the adjacent roadway. Construction activities and staging areas typically detract from visual quality and would have an adverse impact on existing visual resources. Upon completion of the new bridge, the existing bridge would be removed, and the new alignment for Olympic Hot Springs Road would be constructed. These activities would continue to cause negative impacts on the visual quality. The project is expected to take 1.5 to 2 years to complete after start of construction. Once all construction and demolition is completed, there would be gaps in vegetation until the newly planted areas become established, which can take 5-10 years before gaining a natural appearance.

Roadway construction would involve excavation and fills, temporary shoring, embankment and retaining wall construction, reconstruction of existing driveway accesses; and drainage, stormwater, and culvert installations. Embankments would be constructed for the roadway approaches. Retaining walls are proposed at two locations along the roadway and around the bridge abutments.

Long-term effects:

Representative Views

The project is within a single landscape unit. Views were selected to represent those most often seen by highway users, along with views selected to represent the areas that would be most impacted by the project or seen by the most sensitive of viewers. Six views were selected. The Build Alternative would include restoration of these areas and views to as close to pre-construction conditions as is possible.

View 1-View from US 101 Approaching Existing Bridge:

Key View – Looking west

Approaching from the east, this view gives a sense of the confinement of the viewshed. Large mature trees border the roadway on both sides limiting views. The bend in the roadway leads to the intersection of Olympic Hot Springs Road with US 101 and the entrance to the Elwha River Bridge. The gravel road to the right of the highway leads to the parking area for access to the existing Elwha River Observation Area, which is a

cleared gravel area just off the road. The parking area and utilities are the only visible encroachments. The viewshed remains intact and the view quality is high.

Post Construction View Analysis:
Post construction, this approach would be eliminated. The gravel road to the right is the approximate location of the new alignment. The road to the new bridge would begin to curve to the right for the approach of the new bridge. The existing road would be realigned for the new turn-off onto Olympic Hot Springs Road, relocation of the informal parking area, river access path, and viewpoint. There would be negligible encroachment into the bank on the south side of the road, but the new alignment would necessitate vegetation removal and grading to the new bridge approach. Mature trees would be removed, but a mature forest exists behind them and would help visually limit the impact of removal. Areas of exposed soils, where vegetation would be removed for grading and the realignment, would be replanted. The view would be temporarily degraded due to construction.

View 2-View from South East Corner of Bridge:

Key View – Looking east

This view shows the intersection of US 101 and Olympic Hot Springs Road. Guardrails, utilities, and signs encroach on this view. Overall, the viewshed remains intact and this particular view quality is moderate.

Post Construction View Analysis:
This view would be eliminated to through traffic. Any guardrails would be replaced with U.S. Forest Service (USFS) approved guardrails treated with weathering agent for scenic byways. The view would be temporarily degraded due to construction.

View 3-View from North East Corner of Bridge:

Key View – Looking west

This view shows the east end start of the bridge. As the viewer travels west across the bridge, views up and down the Elwha River are revealed within a rolling mature forest. Guardrails and utility lines detract slightly from the attraction of the river. As the viewer crosses the bridge, the viewshed returns to a confined view with mature forest stands on both sides of the road. The viewshed remains intact and view quality is high.

Post Construction View Analysis:
This view would be eliminated to through traffic. The new bridge would allow for the same views up and down the river, with a slight shift to the right (north). As the viewer crosses the bridge from the east, views of the roadway beyond the bridge would be cut off until reaching the end of the bridge when the new roadway realigns with the existing roadway. The view would be temporarily degraded due to construction.

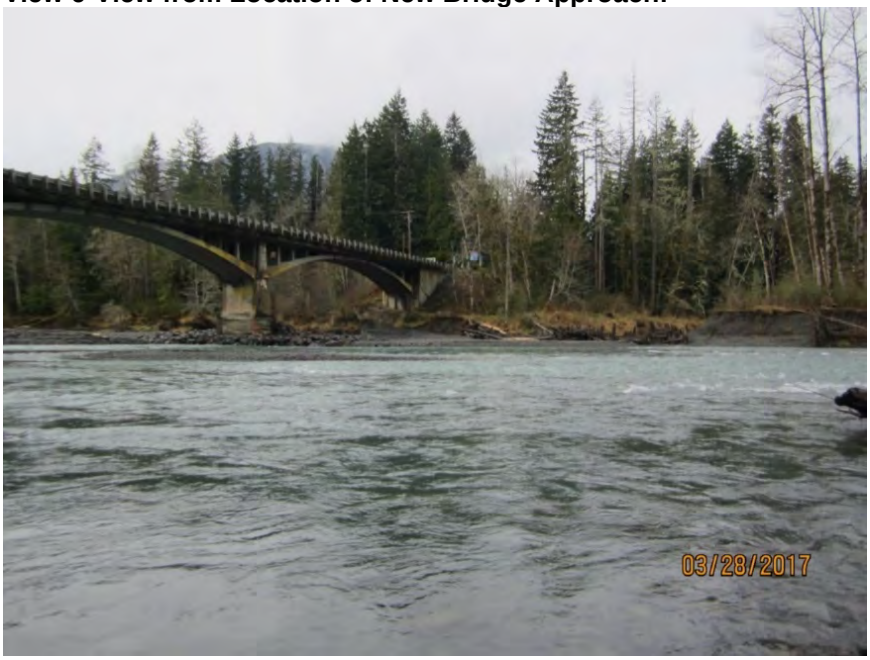
Views 4 and 5 Views from Bridge:

Looking north and south

These views show the Elwha River looking downstream and upstream respectively from the bridge. Power lines have minor impact on the south view. To the left on the south view is the location of the Olympic Hot Springs Road as it follows the river. This segment of the viewshed gives a break from constricted views leading to the bridge. The view quality is high.

Post Construction View Analysis:
The view to the south would remain as-is because the location of the existing bridge abutment would become the new viewpoint. Power lines would be removed, as utilities are re-routed. The views in both directions would remain virtually the same as travelers cross the new bridge slightly to the north.

View 6-View from Location of New Bridge Approach:



Key View – Looking southeast

This view is from the approximate location where the proposed trail would be located, with the proposed parking area to the left. The first abutment for the new bridge would be located just behind (east of) this point, so the actual bridge would be just overhead.

Post Construction View Analysis:
The east end of the existing bridge and the approximate location of the new connection with the current alignment of US 101 is visible in the center of the photo. When the new bridge is completed and open for traffic, the old bridge would be removed. The new crossing would retain similar views over the river as currently exists. Visibility of the proposed relocation of the informal parking area, proposed viewpoint, and some of the proposed trail would detract somewhat from pristine views in both directions, but the overall viewshed would remain intact.

Mitigation Measures:

WSDOT's policy is to remove the minimum amount of vegetation necessary to complete the project. Once the final design has been approved, a tree survey would be undertaken to determine the number and size of trees the project would remove. When trees are removed for a project, WSDOT's policy is to replace them within the limits of the project. All vegetation planted on WSDOT properties will meet all WSDOT setback requirements for sight distance and other safety and maintenance considerations. All plant materials, including seeding would be funded by the project for weed suppression and plant establishment for a minimum of 3 years.

Since US 101 is designated a National Scenic Byway as well as a State Scenic Highway, new guardrail would be treated with a weathering agent by USFS and scenic byway standards.

Cumulative effects of the Build Alternative on Visual Resources

Past, present, and reasonably foreseeable future actions with the potential to impact visual quality include US 101 rehabilitation at Lake Crescent, along with regular maintenance of US 101, and a geotechnical investigation and potential rehabilitation or relocation of the Olympic Hot Springs Road.

Overall, past, present, and reasonably foreseeable future actions would result in adverse impacts on visual quality. The Build Alternative would have short-term, direct, adverse effects on visual quality during new bridge construction and while restoration areas develop. When the incremental impacts of the Build Alternative are added to the impacts of other past, present, and reasonably foreseeable future actions, there would not be noticeable additional cumulative impacts on visual quality. In the long term, the project area would have a high quality visual character much like the current uninterrupted scenic byway.

Conclusion

The No Build Alternative would not include US 101 modifications and would not alter the existing visual quality of the project area in the short-term. In the long-term, the existing US 101 Elwha River Bridge would eventually become unusable and traffic would be diverted as described in the Transportation section of this document. This would result in an adverse effect on visual quality because the integrity of the Pacific Coast Scenic Byway would be interrupted with detours through other areas. Under the Build Alternative, a new bridge would be constructed, the current bridge would be removed, and US 101 would be realigned at the turn-off for Olympic Hot Springs Road. The Build Alternative would temporarily decrease visual quality in the project corridor during construction and while restoration areas develop. In the long term, the project area would have a high quality visual character much like the current uninterrupted scenic byway.

3.4.15 Section 4(f) of the U.S. Department of Transportation Act of 1966

Section 4(f) refers to a special section of the Department of Transportation Act of 1966 which stipulates that U.S. Department of Transportation (USDOT) agencies cannot approve the use of land for transportation projects from publicly-owned parks, recreation areas, wildlife and waterfowl refuges, or public and private historical sites unless the following two conditions apply:

- There is no feasible and prudent alternative to the use of the land from the property.
- The action includes all possible planning to minimize harm to the property resulting from such use.

The project is in an archeologically sensitive area with three discrete archeological sites identified within the project Area of Potential Effect (APE). For archeological sites to qualify as Section 4(f) resources they must 1) be on or eligible for listing on the National Register of Historic Places (NRHP), and 2) warrant preservation in place (23 CFR 774.13(b)). Sites 45CA727, 45CA774, and 45CA775 meet these requirements and are thus considered 4(f) resources. They are Olcott sites eligible for listing in the NRHP under Criteria A and D. The sites are eligible under Criterion A based on their proximity

to the confluence of Indian Creek and the Elwha River, a location of cultural significance to the Lower Elwha Klallam Tribe (LEKT). The confluence represents a well-known fishing camp used for hundreds (if not thousands) of years by Klallam peoples. The confluence is the location of Tee-tee-ulth, a village site described in the ethnographic record (Lane 1972). As such, these sites are "*associated with events that have made a significant contribution to the broad patterns of our history*" in accordance with National Criteria for Evaluation (Criteria A).

As part of a required individual 4(f) evaluation, eight alternatives were considered. The No Build Alternative was the only *avoidance* alternative and was considered to not be prudent. The No Build Alternative was found to not fulfill the project purpose and need and further analysis of impacts was discontinued. Three of the eight alternatives were considered to be feasible and prudent and were advanced to a 4(f) "Least Harm Analysis". If there is no feasible and prudent avoidance alternative, FHWA may approve the alternative that causes the least overall harm in light of the purposes of Section 4(f) from among the alternatives that use Section 4(f) properties. FHWA determined that the Build Alternative described in this EA has the least overall harm of the alternatives considered that also meet the need and purpose of the project. The Build Alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727) as described in the Cultural Resources section (3.4.8) and project MOA (Appendix G). The full individual 4(f) evaluation for the project is presented in the separate document *US 101 Elwha River Bridge Replacement Draft Section 4(f) Evaluation* (WSDOT 2021) which is included in Appendix G.

3.4.16 Hazardous Materials

The old Elwha Resort situated at the east bridge approach formerly used two underground storage tanks at its service station. These tanks and associated distribution lines were installed in 1946, taken out of service in 1992 and ultimately decommissioned and removed in 1997. Soils were identified as being impacted by lead and petroleum at that time. Demolition of the Resort in 2001 included removal of 41 tons of petroleum

impacted soils. The Washington State Department of Ecology (Ecology) ultimately issued a No Further Action Determination for soil associated with the old Resort in August of 2014 (Cleanup Site ID 7511).

A search of theEcology site facility database in March 2021 revealed no known hazardous sites within a half mile of the project area. There is a low risk of encountering hazardous materials in the soil associated with the former Elwha Resort gas station. Prior to removal, the Elwha River Bridge will undergo a good faith asbestos survey.

3.4.17 Climate Change

WSDOT is required to address climate change. WSDOT acknowledges that the effects of climate change may alter the function, sizing, and operation of our facilities. To ensure facilities can function as intended for their planned 50-, 70-, or 100-year lifespan, they should be designed to perform under the variable conditions expected as a result of climate change. For example, drainage culverts may need to be resized to accommodate more intense rainfall events or increased flows due to more rapid glacial thawing.

The Pacific Northwest climate projections are available from the Climate Impacts Group at the University of Washington (UW 2018).

Washington State is likely to experience the following over the next 50 years:

- Increased temperature (extreme heat events, changes in air quality, glacial melting)
- Changes in volume and timing of precipitation (reduced snow pack, increased erosion, flooding)
- Ecological effects of a changing climate (spread of disease, altered plant and animal habitats, negative impacts on human health and well-being)
- Sea-level rise, coastal erosion, saltwater intrusion

US 101 in the vicinity of the Elwha River is rated as having “low vulnerability” to climate change in the Climate Impacts Vulnerability Assessment (WSDOT 2011).

Consistent with requirements, the project team developed the preliminary bridge design for the Build Alternative in light of possible modifications in the surrounding natural environment potentially induced by climate change. As part of standard design, this project has incorporated features that will provide greater resiliency and function with the potential effects brought on by climate change. The existing 1926 bridge is 30 feet above normal high water. The proposed bridge includes a higher clearance above the normal high water of 40 ft. The bridge design also meets the design requirements for hydraulics and seismic activity.

3.3.18 Greenhouse Gas Emissions

WSDOT is required to address greenhouse gas emissions. Vehicles emit a variety of gases during their operation; some of these are greenhouse gases (GHGs). The GHGs associated with transportation are carbon dioxide (CO_2), methane, and nitrous oxide. Any process that burns fossil fuel releases CO_2 into the air. Carbon dioxide makes up the bulk of the emissions from transportation.

Vehicles are a significant source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, and boats) accounts for about 27 percent of total domestic CO_2 emissions. However, in Washington State, transportation accounts for nearly half of GHG emissions because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total GHG emissions in Washington are fossil fuel combustion in the residential, commercial, and industrial sectors at 22 percent and electricity consumption at 17 percent. Figure 9 shows the gross GHG emissions by sector, for Washington State and nationally.

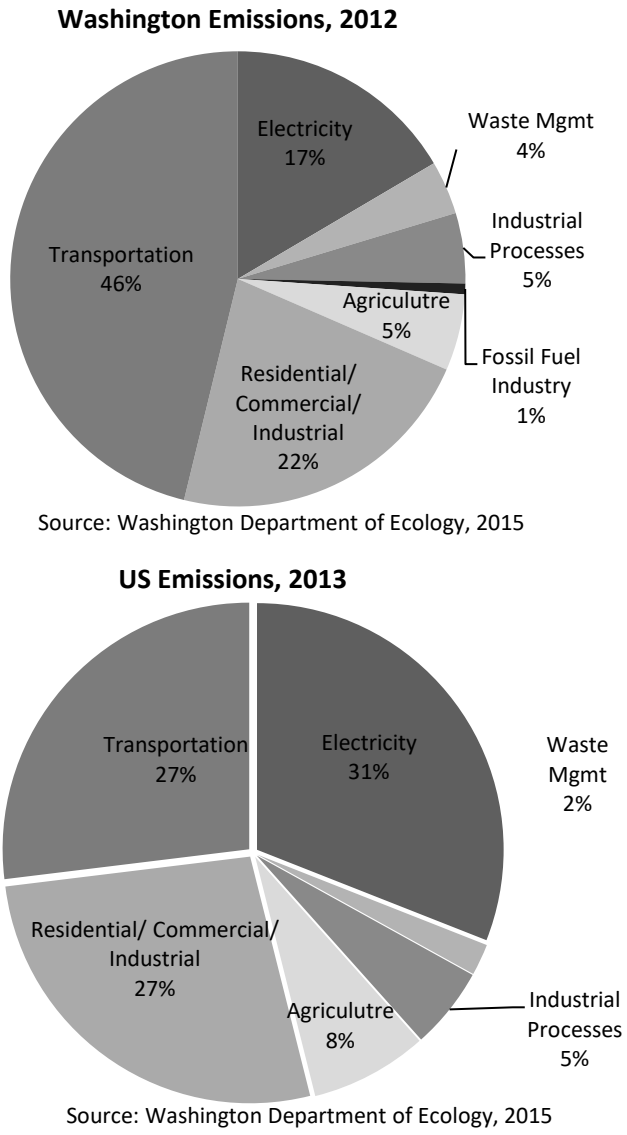


Figure 9. GHG Emissions by Sector, Washington State (2012) and National (2013)

Project Level Green House Gas Emissions

The GHG emissions from a single project action are usually very small, (and often less than without the project). However, overall, users of the transportation system contribute close to half of the state's GHG emissions (see Figure 9). WSDOT believes that transportation GHG emissions are better addressed at the region, state, and transportation systems level where multiple projects can be analyzed in aggregate. We recognize that most current plans at these broader levels do not yet provide the emissions analysis that would put our proposed transportation improvements in a larger context. We also

recognize the public's interest in these issues and the need to disclose GHG emissions at the project level for major public projects.

Effects of the Build Alternative on GHG emissions

The state and federal investments in transportation projects are made to improve current conditions of the multi-modal transportation network. The proposed highway bridge replacement project contains several features that would not increase GHG. In general, project-level actions that can help reduce greenhouse gas emissions include:

- Reducing stop and go conditions
- Improving roadway speeds to a moderate level
- Improving intersection traffic flow to reduce idling
- Creating more safe and efficient freight movement
- Expanding transit and non-motorized options for travelers
- Increasing vegetation density over pre-project conditions to sequester carbon

Construction of the project is currently planned to last 75 years from 2020 to 2095. Project construction and production of materials used in the US 101 Elwha River Bridge Replacement project would release greenhouse gases. Likewise, maintenance activities and materials over the life of the project would produce GHG emissions.

Chapter 4: Consultation and Coordination

4.1 Public and Agency Outreach

Community engagement has been integral to the success of the US 101 Elwha River Bridge Replacement Project. Effort was implemented to ensure effective participation at numerous junctures throughout the planning and environmental review phases of the project. This section provides a summary of the various engagement activities conducted, major messages and themes surfacing from the outreach, and ways in which community engagement has shaped the action alternative.

Overall Approach

The community engagement strategy was designed to involve people in ways that allowed them to provide informed, timely, and meaningful input to the project. The strategy recognized that different members of the community have different needs for engagement and input. It also recognized the need to balance highly technical engagement with opportunities for general interest engagement. The goal was to create multiple opportunities and ways for people to participate.

Project Website

A primary vehicle for providing on-going information to the public was a project website hosted by WSDOT http://www.wsdot.wa.gov/Projects/US101/ElwhaRiverBridgeReplace/default.htm. Visitors to the site could obtain information on the project from easy to understand content on the home page. Those looking for detailed information and data could readily find reports, analysis, summaries, maps, schedules, and other project related information. Visitors can sign up to receive e-mail notifications of meetings and other project milestones. There was also an easy to find form with which to leave detailed questions, comments, and concerns. People took advantage of this communication opportunity to voice their opinions and ask specific questions of interest about the project. Project staff provided detailed and timely responses to every comment and question received.

Electronic Distribution System

The project also employed a robust electronic distribution system to keep local residents informed of project progress. The system, called GovDelivery, allows individuals to self-subscribe to email or text messages free of charge, and currently 850 individuals have availed themselves of that service. In addition, communications about the project are sent to local media, elected officials, first responders, and city and county jurisdictions. With each communication comes an invitation to ask questions or provide comments, to which WSDOT promptly replies.

Presentations

WSDOT staff have made several visits to both Port Angeles and Forks since August 2016 to provide updates in person, the most recent being February 20 and February 21, 2018. WSDOT staff provided updates at the Port Angeles City Council meeting, the Forks Professional and Business Association and the Forks Chamber of Commerce. They were also able to meet with the newly-elected Forks Mayor.

Miscellaneous

In addition to the many project related engagement opportunities noted above, there have been other miscellaneous outreach efforts. From February 27, 2018 to March 14, 2018 a public survey related to recreational access was conducted to gather specific information from the community. Project staff received 275 completed surveys. The surveys demonstrated that the public has an interest in improved recreational access at this location. Social media outreach was a component of the survey process and took place throughout the survey. A bridge briefing was provided to the Peninsula Regional Transportation Planning Organization (RTPO). One-on-one legislative briefings were also provided at several junctures during 2017 and 2018.

Major Messages and Themes heard from the public

Economic and related concerns about bridge closure have been an intense area of public focus. There has been no disagreement among participants to date that the structural integrity of the existing bridge has been compromised and a fix is needed as soon as possible. Although contingencies for detour routes have been carefully established with involvement from the community, the SR 112 and SR 113 detour routes and a no build

solution would involve time intensive travel delays potentially affecting employment, commerce, business interests as well as recreational, health, travel, and social activities.

Residents clearly wanted the design and construction process to go faster. In response, some of the public outreach focused on increasing awareness of bridge replacement requirements, necessary design and environmental processes, and the timeline needed for a project of this scope and size. Generally, residents seem to be satisfied with the overall approach to the project, the interim measures enacted to stabilize and extend the life of the existing bridge, and the level and frequency of communications they were receiving from WSDOT.

A strong preference for a new bridge on a new alignment was another clear message from the public. WSDOT began looking at the problem by identifying seven alternatives that included variations on retrofitting the existing bridge, building a new US 101 connection elsewhere, and building a new bridge. The preference for alternative #7 (new bridge on new alignment) was overwhelmingly preferred by the public and elected officials alike.

Agency Outreach

WSDOT coordinates with agencies that are responsible for issuing environmental permits and who have special expertise in project related fields. This coordination is accomplished through e-mails, meetings, verbal contacts, and official letters. For this project, coordination is ongoing with: FHWA, USFWS, NMFS, EPA, US Army Corps of Engineers (USACOE), Ecology, WDFW, DAHP, and Clallam County.

Tribal Outreach & Coordination

To ensure that WSDOT takes into account the effects on properties listed in, or eligible for listing in the National Register of Historic Places, WSDOT initiated Section 106 consultation with several tribes including the Lower Elwha Klallam Tribe, the Makah Tribe, Port Gamble S'Klallam Tribe, and Jamestown S'Klallam Tribe (JSKT). These tribes were invited to review the project Area of Potential Effect (APE) in April 2017 and were invited to comment on an archeological testing report in November of 2018. WSDOT Olympic Region Administrator, John Wynands, has been meeting regularly

with the Lower Elwha Klallam Tribe Chairperson Frances Charles about cultural resource issues as well as a variety of other project related concerns throughout the project planning and environmental documentation phases of the project.

Through the consultation exchange of letters included in Appendix E, we want to ensure that the tribal governments are afforded the opportunity to:

- Identify any concerns they may have regarding the effects of the proposed undertaking on historic properties;
- Advise FHWA and WSDOT on the identification and evaluation of historic properties, including those of traditional religious and cultural importance;
- Express their views on the undertaking's effects on such properties; and,
- Participate in the resolution of any adverse effects which the undertaking might have on those properties.

As defined by the Advisory Council on Historic Preservation, consultation means "...the process of seeking, discussing, and considering the views of other participants and, where feasible, seeking agreement with them regarding matters arising in the section 106 process." Consultation is fundamental to the process of seeking ways to avoid, minimize or mitigate the effects of the undertaking on historic properties. Consequently, the tribe's active participation as a consulting party in the proposed undertaking is encouraged. The letter exchange to document our consultation is included in Appendix E.

William "Bill" White, LEKT Tribal Archaeologist, contributed to project research design and visited during fieldwork on January 9 and 21, 2018. Bill was also helpful in making connections to provide LEKT and JSKT tribal members for the field crew. The Section 106 consultation is an ongoing effort with involvement from the LEKT, NPS, WSDOT, FHWA and the Washington State Department of Archaeology and Historic Preservation (DAHP). A Memorandum of Agreement (MOA), signed by consulting parties in May 2021 , details how the adverse effects to cultural resources will be managed and mitigated. .

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Appendix A Elwha Act Legislation

Elwha River Ecosystem and Fisheries Restoration Act
One Hundred Second Congress of the United States of America
January 3, 1992

To restore Olympic National Park and the Elwha River ecosystem and fisheries
(Enrolled Bill (Sent to President))

--H.R.4844--

H.R.4844

One Hundred Second Congress of the United States of America
AT THE SECOND SESSION
Begun and held at the City of Washington on Friday, the third day of January,
one thousand nine hundred and ninety-two
An Act
To restore Olympic National Park and the Elwha River ecosystem and fisheries
in the State of Washington.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be referred to as the `Elwha River Ecosystem and Fisheries Restoration Act'.

SEC. 2. DEFINITIONS.

For the purposes of this Act:

(a) The term `Administrator' means the Administrator of the Bonneville Power Administration.

(b) The term `Commission' means the Federal Energy Regulatory Commission.

(c) The term `electric power' means electric peaking capacity or electric energy or both.

(d) The term `Elwha Project' means the Elwha River Hydroelectric Project, Federal Energy Regulatory Commission Project Number 2683, including appurtenant works and project lands, located on the Elwha River in Clallam County, Washington.

(e) The term `Glines Project' means the Glines Canyon Hydroelectric Project, Federal Energy Regulatory Commission Project Number 588, including appurtenant works and project lands, located on private and public lands both within and without the exterior boundaries of Olympic National Park on the Elwha River in Clallam County, Washington.

(f) The term `local industrial consumer' means the owner of the pulp and paper mill located on Ediz Hook in Port Angeles, Washington, that, on the date of enactment of this Act, receives and consumes the electric power produced by the Projects, or its successors or assignees.

(g) The term `local preference customer' means Port Angeles City Light.

(h) The term `owner' means the current owner of the Projects or its successors or assignees, but shall not mean the Secretary, the United States, or any other entity acquiring title to the Projects or features thereof pursuant to the terms of this Act.

(i) The term `Park' means Olympic National Park.

(j) The term `Project' or `Projects' means either or both the Elwha Project and the Glines Project, including project works and appurtenant lands.

(k) The term `project replacement power' means electric power delivered to the local industrial consumer to replace losses of electric power generation from the Projects following their acquisition by the Secretary pursuant to this Act, in an amount not to exceed 172.088 gigawatthours of energy in any year.

(l) The term `Secretary' means the Secretary of the Interior.

(m) The term `State' means the State of Washington, including its agencies and departments.

SEC. 3. ACQUISITION OF PROJECTS.

(a) Effective sixty days after submission to the Congress of the report referred to in section 3(c), the Secretary is authorized to acquire the Elwha and Glines Canyon Projects, and all rights of the owner and local industrial consumer therein, subject to the appropriation of funds therefor: Provided, That the Secretary shall not acquire the projects unless he has determined pursuant to subsection (c) that removal of the Project dams is necessary for the full restoration of the Elwha River ecosystem and native anadromous fisheries and that funds for that purpose will be available for such removal within two years after acquisition.

(b) The consideration for acquisition of the Projects shall be $29.5 million and no more, to be paid by the Secretary to the owner and local industrial consumer at the time of acquisition, and shall be conditioned on a release of liability providing that all obligations

and liabilities of the owner and the local industrial consumer to the United States arising from the Projects, based upon ownership, license, permit, contract, or other authority, including, but not limited to, project removal and any ecosystem, fish and wildlife mitigation or restoration obligations, shall, from the moment of title transfer, be deemed to have been satisfied: Provided, That the United States may not assume or satisfy any liability, if any, of the owner or local industrial consumer to any federally recognized Indian Tribe nor shall such liability to the Tribe, if any, be deemed satisfied without the consent of such Tribe.

(c) The Secretary shall prepare a report on the acquisition of the Projects and his plans for the full restoration of the Elwha River ecosystem and the native anadromous fisheries and submit such report on or before January 31, 1994, to the Appropriations Committees of the United States Senate and the United States House of Representatives, as well as to the Committee on Energy and Natural Resources of the Senate and the Committees on Energy and Commerce, Interior and Insular Affairs, and Merchant Marine and Fisheries of the United States House of Representatives. The report shall contain, without limitation:

(1) The precise terms of acquisition of the Projects, with an analysis of the costs, in addition to the consideration set out in section 3(b), and potential liabilities and benefits, if any, to the Federal Government resulting from the acquisition and all other actions authorized under this Act;

(2) Alternatives, in lieu of dam removal, for the restoration of the Elwha River ecosystem and the native anadromous fisheries and wildlife of the Elwha River Basin, consistent with the management plan of the Park, the rights of any Indian tribe secured by treaty or other Federal law, and applicable State law. The report shall include feasibility studies for each alternative considered and a definite plan for removal. Such definite plan shall include the timetable after conveyance for removal of the dams and the plans for removal and disposal of sediment, debris, and other materials consistent with all applicable environmental laws and a detailed explanation of all costs of removal. In conducting the feasibility studies and in the preparation of the definite plan, the Secretary is authorized to use the services of any Federal agency on a reimbursable basis and the heads of all Federal agencies are authorized to provide such technical and other assistance as the Secretary may request. For each alternative considered, the Secretary shall estimate total costs, environmental risks and benefits, the potential for full restoration of the Elwha River ecosystem and native anadromous fisheries, and the effect on natural and historic resources (together with any comments made by the Advisory Council on Historic Preservation for any properties which are listed, or eligible for listing, on the National Register of Historic Places).

(3) Specific proposals for management of all lands or interests therein acquired pursuant to this Act which are located outside the exterior boundaries of the Olympic National Park. The Secretary shall specifically address the suitability of such lands, or portions thereof, for addition to the National Wildlife Refuge System; National Park System; transfer to the Lower Elwha Klallam Tribe in trust for tribal housing, cultural, or economic development purposes in accordance with a plan developed by the Lower Elwha Klallam Tribe in consultation with the Secretary; and development and use by the State. Upon acquisition, all lands and interests therein within the exterior boundaries of the Park shall be managed pursuant to authorities otherwise applicable to the Park. For the purposes of protecting the Federal investment in restoration, that portion of the river outside the Park on which the Federal Government will acquire both banks shall, upon such acquisition, be managed in

accordance with the declared policy of section 1(b) of Public Law 90-542, except that modifications necessary to restore, protect, and enhance fish resources and to protect the existing quality of water supplied from the river are hereby authorized.

(4) Specific proposals and any Federal funding and the availability of that funding that may be necessary to protect the existing quality and availability of water from the Elwha River for municipal and industrial use from possible adverse impacts of dam removal.

(5) Identification of any non-Federal parties or entities, excluding Federally recognized Indian tribes, which would directly benefit from the commercial, recreational, and ecological values that would be enhanced by the restoration of the Elwha River ecosystem and fisheries, if the Secretary believes that such parties or entities should assume some portion of the cost involved in the restoration, together with the specific cost-share provisions which the Secretary deems necessary and reasonable.

(d) In preparing his report, the Secretary shall consult with appropriate State and local officials, affected Indian tribes, the Commission, the Environmental Protection Agency, the Secretary of Energy, the Administrator, the Pacific Northwest Power Planning Council, the Secretary of Commerce, and of the Advisory Council on Historic Preservation, as well as interested members of the public. In addition, the Secretary shall afford an opportunity for public comment on the report prior to its submission to the Congress.

(e) Upon the appropriation of the sum provided for in section 3(b) for the acquisition of the Projects and the determination that dam removal is necessary, the owner and local industrial consumer shall convey to the United States, through the Secretary, title to the Projects, including all property and all other rights and interests. Upon such conveyance and payment of the consideration as provided in section 3(b), and without further action by the United States, title shall transfer and vest in the United States, the owner and local industrial consumer shall be released from any further liability to the United States, as provided in section 3(b), and the acquisition from the owner and local industrial consumer shall be deemed to be completed.

SEC. 4. ECOSYSTEM AND FISHERIES RESTORATION.

(a) Effective sixty days after submission of the report referred to in section 3(c) and following the conveyance in section 3(e), the Secretary is authorized and directed, subject to the appropriation of funds therefor, to take such actions as are necessary to implement- -

(1) the definite plan referred to in section 3(c)(2) for the removal of the dams and full restoration of the Elwha River ecosystem and native anadromous fisheries;

(2) management of lands acquired pursuant to this Act which are located outside the exterior boundaries of the Park; and

(3) protection of the existing quality and availability of water from the Elwha River for municipal and industrial uses from possible adverse impacts of dam removal.

(b) The definite plan referred to section 3(c)(2) must include all actions reasonably necessary to maintain and protect existing water quality for the City of Port Angeles, Dry Creek Water

Association, and the industrial users of Elwha River water against adverse impacts of dam removal. The cost of such actions, which may include as determined by the Secretary, if reasonably necessary, design, construction, operation and maintenance of water treatment or related facilities, shall be borne by the Secretary. Funds may not be appropriated for removal of the dams, unless, at the same time, funds are appropriated for actions necessary to protect existing water quality.

(c) Nothing in this section shall be construed as an entitlement for which a claim against the United States may be made under the Tucker Act.

SEC. 5. PROJECT OPERATION AND REPLACEMENT POWER.

(a) Notwithstanding any other provision of law, neither the Federal Energy Regulatory Commission nor any other agency of the Federal Government shall have the authority or jurisdiction to issue a permanent license or similar order with respect to either Project prior to conveyance as provided in section 3(e), except that the Commission shall have jurisdiction under the Federal Power Act and is hereby authorized and directed to issue or maintain in effect annual licenses or authorizations for both Projects, authorizing continued operation of both Projects by the owner and local industrial consumer, such operation to be under such terms and conditions and in accordance with such practices as existed on September 1, 1992, until (1) the date the Secretary has acquired title to the Projects or (2) if the Secretary's report required in section 3(c) does not provide for dam removal, five years after the expiration of the current annual license or authorization then in effect, after which time the Commission shall have authority under the Federal Power Act to issue appropriate licenses with respect to such Projects to the extent the Commission has jurisdiction over such Projects under such Act on the date of enactment of this Act.

(b) To ensure the availability of adequate electric power supplies to the operating facilities of the local industrial consumer, the Administrator shall, following acquisition of the Projects pursuant to this Act, deliver all project replacement power required by the operating facilities of the local industrial consumer through the local preference customer at a rate equal to the priority firm rate, or the rate which is then the equivalent of the priority firm rate if that designation is no longer used by the Administrator, as such rate is fixed by the Administrator from time to time, without regard to any new large single load determinations or similar factors. The local industrial consumer shall pay the local preference customer for such project replacement power at the same rate as all other industrial consumers of the local preference customer.

(c) Upon conveyance of the Projects to the United States, the Secretary shall maintain the dams in a safe condition for the period prior to their removal.

SEC. 6. LEASE OF FEDERAL LANDS.

(a) LEASE OF LANDS TO THE CITY OF PORT ANGELES- After the Secretary makes the determination to remove the dams and actually acquires the projects and funds are appropriated for such conveyance and removal, the Secretary is authorized to issue a lease to the City of Port Angeles, Washington, for those lands situated on Ediz Hook, Clallam County, Washington, currently leased to the City under Lease No. DOT-CG13- 4811-72, dated April 4, 1972, as amended, except for that parcel of land described in subsection (b)(2).

Such lease shall be issued pursuant to the Act of June 14, 1926, as amended (43 U.S.C. 869), for a period of 99 years, beginning on a date to be determined by the Secretary, without right of patent.

(b) LEASE OF LANDS TO THE LOWER ELWHA KLALLAM TRIBE- (1) After the Secretary makes the determination to remove the dams and actually acquires the Projects and funds are appropriated for such conveyance and removal, the Secretary is authorized to lease to the Lower Elwha Klallam Tribe that parcel of land situated on Ediz Hook, Clallam County, Washington, described in paragraph (2) for the purposes of the construction and operation of a tribal cultural facility, such as a longhouse or a museum, and associated interpretive and parking facilities. Such lease shall be issued pursuant to the Act of June 14, 1926, as amended (43 U.S.C. 869), for a period of ninety-nine years beginning on a date determined by the Secretary, without right of patent.

(2) The parcel of land to be leased to the Lower Elwha Klallam Tribe is that parcel of land lying south of the existing roadway and extending southward to the southern boundary of the land currently leased to the City of Port Angeles (Lease No. DOT-CG13- 4811-72, dated April 4, 1972, as amended) and beginning at the north-south line 200 ft east of the western boundary of Out Lot 6 and running easterly 600 ft to the north-south line 300 ft west of the eastern boundary of Out Lot 6.

(3) In addition to the general terms and conditions applicable under the Act of June 14, 1926, as amended (43 U.S.C. 869), the lease to the Tribe shall be subject to the following terms and conditions:

(A) There shall be public access to the beach along the south side of the parcel at all times.

(B) The City of Port Angeles shall have the right to construct and maintain a waterfront trail adjacent to the existing roadway along the north side of the parcel, the location of which shall be determined in conjunction with the Secretary.

(C) Parking facilities on the parcel shall be open to the public at all times.

(c) In addition to the terms and conditions described in this section for the leases to the City and the Tribe, the Secretary shall incorporate by reference into each lease the Agreement entered into on August 11, 1992, between the City and the Tribe regarding the use of the adjacent leaseholds.

SEC. 7. TRIBAL LAND ACQUISITION AND DEVELOPMENT.

(a) After the Secretary makes the determination to remove the dams and actually acquires the Projects and funds are appropriated for such conveyance and removal, the Secretary is authorized to acquire by purchase, and hold in trust in reservation status for the benefit of the Lower Elwha Klallam Tribe, lands in Clallam County, Washington, for housing, economic development, and moorage for the Tribal commercial fishing fleet.

(b) There is authorized to be appropriated an amount not to exceed $4,000,000 to carry out the land acquisition purposes of this section.

SEC. 8. SAVINGS.

(a) Nothing in this Act shall abridge or modify existing rights to Elwha River water.

(b) Nothing in this Act shall affect the rights of any Indian Tribe secured by Treaty or other law of the United States.

(c) This Act does not modify any of the Administrator's obligations or require the Administrator to take any actions regarding the protection, mitigation, or enhancement of fish and wildlife or expand those provided for under the Pacific Northwest Power Planning and Conservation Act, Public Law 96-501. Notwithstanding any other provision of law, the Administrator shall not be required to make any expenditures from the Bonneville Power Administration fund for the operation, maintenance, rehabilitation, improvement, or removal, breach, or bypass of the Projects.

SEC. 9. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary of the Interior for expenditure through the Assistant Secretary for Fish, Wildlife, and Parks and to the Secretary of Commerce for expenditure through the National Marine Fisheries Service such sums as may be necessary to carry out the purposes of this Act: Provided, That such authorization shall not become effective until sixty days following submission of the report provided for in section (3)(c) of this Act.

Speaker of the House of Representatives.

Vice President of the United States,
President of the Senate.

Appendix B Discipline Studies/Memos and List of Preparers

The following individuals contributed to the production of this environmental assessment.

Name	Company	Role
Paul Dreisbach	*WSDOT*	*Author*
Jeff Sawyer	*WSDOT*	*Reviewer*
Roger Kiers	*WSDOT*	*Cultural Resources Reviewer*
Carl Ward	*WSDOT*	*Biology Reviewer*
Victoria Book	*WSDOT*	*Reviewer*
Megan White	*WSDOT*	*Reviewer*
Christina Miller	*Olympic National Park*	*Author*
Brian Winter	*Olympic National Park*	*Reviewer*
Lee Taylor	*Olympic National Park*	*Reviewer*
Sarah Creechbaum	*Olympic National Park*	*Reviewer*
Louise Johnson	*Olympic National Park*	*Reviewer*
Dave Conca	*Olympic National Park*	*Reviewer*
Pat Crain	*Olympic National Park*	*Reviewer*
Janet Coles	*Olympic National Park*	*Reviewer*
Courtney Leas	*FHWA*	*Guidance*
Dean Moberg	*FHWA*	*Guidance / Review*
Liana Liu	*FHWA*	*Review*
Sharon Love	*FHWA*	*Guidance / Review*

Noise Technical Memorandum
US 101 Elwha River Bridge Replacement, WSDOT, April 12, 2018

Preliminary Hydraulic Analysis for the Biological Assessment
US 101 Elwha River Bridge Replacement, WSDOT State Hydraulics Engineer, July 23, 2017

Biological Assessment
US 101 Elwha River Bridge Replacement, Parametrix, Inc., September 2017

Visual Impact Assessment
US 101 Elwha River Bridge Replacement, WSDOT, April 2018

Appendix C EA Distribution List

Wide distribution of the Environmental Assessment will continue to foster effective communication between FHWA, WSDOT, Olympic National Park, public agencies, tribal governments, and the local community regarding the US 101 Elwha River Bridge Replacement

Federal Agencies/
Director Office of Environmental Policy and Compliance – Department of the Interior
U.S. National Park Service
U.S. Forest Service
Bureau of Reclamation
Federal Highway Administration
Federal Emergency Management Agency
National Marine Fisheries Service
U.S. Environmental Protection Agency, Region 10
U.S. Army Corps of Engineers, Seattle District Office
U.S. Fish and Wildlife Service

State Agencies
Department of Archaeology and Historic Preservation Department of Commerce
Department of Ecology
Office of Attorney General
Department of Fish and Wildlife
Department of Natural Resources
WA Parks and Recreation
Puget Sound Partnership

Regional Agencies
Clallam Transit System
Peninsula RTPO
Clallam County Planning Department
Clallam County SEPA Reviewer
Clallam County Sheriff's Department

Local Agencies
City of Port Angeles Fire Department
City of Port Angeles Police Department
City of Port Angeles SEPA Reviewer
City of Forks
East Jefferson Fire & Rescue
Port Angeles School District
Clallam County Fire District
Clallam County PUD

Native American Tribes

Lower Elwha Klallam Tribe
Port Gamble S'Klallam Tribe
Jamestown S'Klallam Tribe
Makah Tribe

24th District Legislators
Kevin Van De Wege
Mike Chapman
Steve Tharinger

Appendix D Environmental Commitments

Resource	Commitments
Soils	To the extent possible, earthwork operations will be limited to the drier times of the year when erosion potential is reduced. This can be accomplished by careful planning of construction staging and by the use of geometric covers. Potential for erosion during construction operations would be replaced by following the BMP's outlined in the Standard Specification Erosion Control Requirements and the Temporary Erosion and Sediment Control (TESC) Plan sections of WSDOT's Highway Runoff Manual and Environmental Manual.
Vegetation	Temporary impact areas would be restored with native trees and shrubs. Some portions of the vacated US 101 roadway would similarly be restored where project elements such as the realigned turnoff for the Olympic Hot Springs Road or stormwater treatment facilities are not designated. A total of 5.14 acres of project area are designated for restoration with native vegetation as part of the Build Alternative.
SurfaceWater	Water quality effects would be limited by the use of Best Management Practices (BMPs) which would be outlined in the contract specifications for the project. The project would maintain compliance with state water regulations in WAC 173-201A. Before project completion, WSDOT would install water quality treatment facilities along new roadway segments and construct conveyance structures to carry stormwater to planned treatment areas and discharge points.
Fish/Wildllife/ESA	The project Biological Assessment (Section 1.4) (WSDOT & FHWA 2017) prescribes numerous specific impact avoidance and minimization measures pertaining to fish species. These include species specific measures such as for Bull Trout, general impact avoidance and minimization, BMP's to reduce the risk of delivering sediment to waterbodies, BMP's to reduce the risk of introducing pollutants to waterbodies, and BMP's for in-channel construction (eg. restricting work to approved "in-water work windows"). Project activities will fully comply with the Hydraulic Project Approval's (HPAs) issued for the project by WDFW. The contractor will designate at least one employee as the erosion and spill control lead. That person will be responsible for installing and monitoring erosion control measures and maintaining spill containment and control equipment. The

	erosion and spill control lead will also be responsible for ensuring compliance with all local, state, and federal erosion and sediment control requirements, including discharge monitoring reporting for the Washington State Department of Ecology. Erosion control blankets or an equally effective BMP will be installed on steep slopes that are susceptible to erosion and where ground-disturbing activities have occurred. Doing so will prevent erosion and assist with establishment of native vegetation. Project staging and material storage areas will be located a minimum of 150 feet from surface waters or in currently developed areas such as parking lots or previously developed sites. Erodible material that may be temporarily stored for use in project activities will be covered with plastic or other impervious material during rain events to prevent sediments from being washed from the storage area to surface waters. Exposed soils will be seeded and covered with straw mulch or an equally effective BMP after construction is complete. Any temporary construction impact areas will be revegetated with native plants following final grading activities. All exposed soils will be stabilized during the first available opportunity, and no soils shall remain exposed for more than 2 days from October 1 to April 30, and for more than 7 days from May 1 to September 30. Any areas disturbed on a temporary basis will be permanently stabilized and restored in a manner consistent with the WSDOT's Roadside Policy Manual (WSDOT 2015). The WSDOT will remove any temporary fills and till-compacted soils, and restore woody and herbaceous vegetation according to an engineer-approved restoration or planting plan. A minimum 1-year plant establishment plan will be implemented to ensure survival, or replacement, of vegetation by stem count at the end of 1 year. Elwha River flows will be monitored throughout construction using the Northwest River Forecast Center station at McDonald Bridge, upstream of the project site. During flow events approaching the 2-year discharge, equipment and materials will be moved off the access pads until water levels subside.

	During flow events approaching the 2-year discharge, equipment and materials will be moved off the demolition laydown pads until waters subside. Portions of the cofferdam may be selectively removed to provide flow relief and prevent catastrophic failure. Engineered log jams will be installed to mitigate for in-stream impacts.
Cultural Resources	WSDOT is currently undergoing Section 106 consultation with the LEKT and Department of Archeology and Historic Preservation (DAHP) to address potential project impacts and appropriate mitigation measures. A Memorandum of Agreement (MOA), signed by consulting parties in May 2021,details how the adverse effects to cultural resources will be managed and mitigated. .
Visual Resources	WSDOT will remove the minimum amount of vegetation necessary to complete the project. Once the final design has been approved, a tree survey would be undertaken to determine the number and size of trees the project would remove. When trees are removed for a project, WSDOT replaces them within the limits of the project. All vegetation planted on WSDOT properties will meet all WSDOT setback requirements for sight distance and other safety and maintenance considerations. All plant materials, including seeding would be funded by the project for weed suppression and plant establishment for a minimum of 3 years. Since US 101 is designated a National Scenic Byway as well as a State Scenic Highway, new guardrail would be treated with a weathering agent by USFS and scenic byway standards.
Greenhouse Gas Emissions	The project traffic plan includes strategic construction timing (like night work) to continue moving traffic through the area and reduce backups to the traveling public to the extent possible. WSDOT will seek to set up active construction areas, staging areas, and material transfer sites in a way that reduces standing wait times for equipment. WSDOT will work with our partners to promote ridesharing and other commute trip reduction efforts for employees working on the project.

U.S. Department
of Transportation

**Federal Highway
Administration**

Washington Division

Suite 501 Evergreen Plaza
711 South Capitol Way
Olympia, Washington 98501-1284
(360) 753-9480
(360) 753-9889(FAX)
http://www.fhwa.dot.gov/wadiv

September 11, 2017

HFO-WA.4/WA3188

Kim Kratz
National Marine Fisheries Service
510 Desmond Drive SE, Suite 103
Lacey, WA 98503

US 101/Elwha River Bridge - Bridge Replacement
Request for Formal Consultation

Dear Mr. Kratz:

The Federal Highway Administration (FHWA) is providing funding to the Washington State Department of Transportation (WSDOT) to replace the Elwha River Bridge on United States (US) 101 in Clallam County, Washington. The project is located in Township 30 N, Range 7 W, section 28; WRIA 18 (Elwha-Dungeness); and sixth-level hydraulic unit code (HUC) 171100200514 (Lake Aldwell-Elwha River).

The replacement project includes construction of a new bridge and roadway and removal of the existing US 101 bridge. The critical and urgent need for the project became apparent when changes in the flow and sediment transport regime of the Elwha River started to undermine the piers that support the existing bridge following the removal of the Elwha Dam in 2012 and the Glines Canyon Dam in 2014. Emergency stabilization measures were completed in 2016 and 2017. Construction is scheduled to begin in June 2018 and be completed in summer of 2019.

A Biological Assessment (BA) was prepared on our behalf for listed species as required under Section 7(c) of the Endangered Species Act. We have determined the project activities warrant an effect determination of ***"may affect, likely to adversely affect"*** for Puget Sound Chinook, Puget Sound steelhead, and steelhead critical habitat; and ***"may affect, not likely to adversely affect"*** for southern DPS eulachon. Other species and critical habitats listed for this project were evaluated and it was determined this project will have ***"no effect"*** to these species and habitats due to lack of occurrence.

An essential fish habitat (EFH) assessment for the project is included as an appendix to the BA. It was determined that the project ***"may adversely affect"*** Pacific salmon freshwater EFH in the Elwha River.

FHWA and WSDOT met with DeeDee Jones and other interested resource agencies on April 11, 2017, for an early coordination meeting. FHWA and WSDOT also met with DeeDee and Michael MacDonald on May 24, 2017, for a pre-BA meeting.

Due to large file sizes, we are unable to email a copy of the BA. A copy of the BA is available for download on the WSDOT FTP site in the following location:

ftp://ftp.wsdot.wa.gov/incoming/Elwha/

There are two files that comprise the complete BA, "ElwhaBA_2017-09-07.pdf" and "ElwhaBA_Appendices_2017-09-07.pdf". If you have difficulty obtaining the files, please let us know and we will make alternative arrangements to get you a copy.

We are requesting formal consultation on Chinook, steelhead, and steelhead critical habitat, and informal consultation on eulachon. FHWA requests a copy of the draft incidental take statement, terms and conditions, and reasonable and prudent measures for review prior to finalizing the Biological Opinion.

It is our understanding that following the completion of formal consultation, our responsibilities under Section 7(c) of the Endangered Species Act will be satisfied. Please contact Carl Ward at WSDOT (360-570-6706, carl.ward@wsdot.wa.gov) if you require additional information or have any questions about this project.

Sincerely,

DANIEL M. MATHIS, P.E.
Division Administrator

By: Dean Moberg
Area Engineer

Cc electronically: cc: Carl Ward, WSDOT
Marion Carey, WSDOT
DeeDee Jones, NMFS
Sandra Manning, ACOE

U.S. Department
of Transportation

**Federal Highway
Administration**

Washington Division

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(360) 753-9480
(360) 753-9889(FAX)
http://www.fhwa.dot.gov/wadiv

September 11, 2017

HFO-WA.4/WA3188

Eric Rickerson
US Fish & Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, WA 98503

US 101/Elwha River Bridge - Bridge Replacement
Request for Formal Consultation

Dear Mr. Rickerson:

The Federal Highway Administration (FHWA) is providing funding to the Washington State Department of Transportation (WSDOT) to replace the Elwha River Bridge on United States (US) 101 in Clallam County, Washington. The project is located in Township 30 N, Range 7 W, section 28; WRIA 18 (Elwha-Dungeness); and sixth-level hydraulic unit code (HUC) 171100200514 (Lake Aldwell-Elwha River).

The replacement project includes construction of a new bridge and roadway and removal of the existing US 101 bridge. The critical and urgent need for the project became apparent when changes in the flow and sediment transport regime of the Elwha River started to undermine the piers that support the existing bridge following the removal of the Elwha Dam in 2012 and the Glines Canyon Dam in 2014. Emergency stabilization measures were completed in 2016 and 2017. Construction is scheduled to begin in June 2018 and be completed in summer of 2019.

The enclosed Biological Assessment (BA) was prepared on our behalf for listed species as required under Section 7(c) of the Endangered Species Act. We have determined the project activities warrant an effect determination of ***"may affect, likely to adversely affect"*** for bull trout and bull trout critical habitat; and ***"may affect, not likely to adversely affect"*** for Northern spotted owl, marbled murrelet, and Taylor's checkerspot butterfly. Other species and critical habitats listed for this project were evaluated and it was determined this project will have ***"no effect"*** to these species and habitats due to lack of occurrence.

FHWA and WSDOT met with DeeDee Jones and Leslie Durham along with other interested resource agencies on April 11, 2017, for an early coordination meeting. FHWA and WSDOT met with DeeDee and Leslie on May 24, 2017, for a pre-BA meeting. WSDOT and the consultant team staff met with DeeDee and staff from USFWS in Lacey, Washington, for early coordination on July 10, 2017.

We are requesting formal consultation on bull trout and bull trout critical habitat, and informal consultation on Northern spotted owl, marbled murrelet, and Taylor's checkerspot butterfly. FHWA requests a copy of the draft incidental take statement, terms and conditions, and reasonable and prudent measures for review prior to finalizing the Biological Opinion.

It is our understanding that following the completion of formal consultation, our responsibilities under Section 7(c) of the Endangered Species Act will be satisfied. Please contact Carl Ward at WSDOT (360-570-6706, carl.ward@wsdot.wa.gov) if you require additional information or have any questions about this project.

Sincerely,

DANIEL M. MATHIS, P.E.
Division Administrator

By: Dean Moberg
Area Engineer

Cc electronically: cc: Carl Ward, WSDOT
Marion Carey, WSDOT
DeeDee Jones, NMFS
Leslie Durham, USFWS
Sandra Manning, ACOE

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

Refer to NMFS No:
WCR-2017-7873

March 2, 2018

Daniel M. Mathis
Division Administrator
Federal Highway Administration
Evergreen Plaza Building
711 South Capitol Way, Suite 501
Olympia, Washington 98501-1284

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, Letter of Concurrence, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the U.S. 101 Elwha Bridge Replacement Project, Clallam County, Washington. (HUC 171100200514 Lake Adwell-Elwha River)

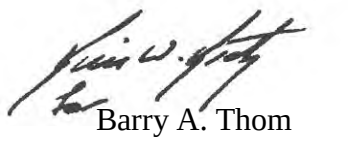
Dear Mr. Mathis:

Thank you for your letter of September 11, 2017, requesting consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 USC 1531 *et seq*.) for the US 101 Elwha River Bridge Replacement Project. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1855(b)) for that project. In the enclosed biological opinion, NMFS concludes that the proposed actions are not likely to jeopardize the continued existence of Puget Sound Chinook salmon and Puget Sound steelhead, and is not likely to destroy or adversely modify Puget Sound steelhead critical habitat.

This document also contains the results of the MSA Essential Fish Habitat (EFH) consultation. The Federal Highway Administration (FHWA) determined that the project will adversely affect Pacific salmon EFH. NMFS concurs with that determination and is, therefore, providing conservation recommendations pursuant to the MSA (section 305(b)(4)(A)). The FHWA must respond to those recommendations within 30 days (MSA section 305(b)(4)(B)).

Please contact Jennifer Quan at 360-753-6054 or by e-mail at Jennifer.Quan@noaa.gov if you have any questions concerning this document, or if you require additional information.

Sincerely,



Barry A. Thom
Regional Administrator

cc: Leslie Durham, USFWS
Kevin Bartoy, WSF
Rick Huey, WSF
Michelle Meade, WSDOT
Jeff Dreier, WSDOT
George Ritchotte

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

MAR 19 2018

In Reply Refer To:
01EWFW00-2017-F-1500

Daniel Mathis
U.S. Department of Transportation
Federal Highway Administration
Suite 501 Evergreen Plaza
711 South Capitol Way
Olympia, WA 98501-1284

Dear Mr. Mathis:

This letter transmits the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion on the proposed US 101 Elwha Bridge Replacement Project located in Clallam County, Washington, and its effects on bull trout (*Salvelinus confluentus*) and bull trout critical habitat. Formal consultation on the proposed action was conducted in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your September 11, 2017, request for formal consultation was received on September 13, 2017.

The enclosed Biological Opinion is based on information provided in the September 11, 2017, Biological Assessment (BA), telephone conversations, field investigations, and other sources of information cited in the Biological Opinion. A complete record of this consultation is on file at the Washington Fish and Wildlife Office in Lacey Washington.

The BA also included a request for USFWS concurrence with "not likely to adversely affect" determinations for certain listed species. The enclosed document includes a section separate from the Biological Opinion that addresses your concurrence requests. We included a concurrence for the northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), and Taylor's checkerspot butterfly (*Euphydryas editha taylori*). The rationale for these concurrences is included in the concurrence section.

If you have any questions regarding the enclosed Biological Opinion, our response to your concurrence request(s), or our shared responsibilities under the ESA, please contact George Ritchotte at 206-356-0511 or Martha Jensen at 360-753-9000.

Sincerely,

Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

Enclosure

cc:
FHWA, Olympia, WA (C. Callahan)
USFWS, Lacey, WA (D. Jones)
Herrera Inc., Seattle, WA (G. Richotte)

Washington State Department of Transportation

Olympic Region
Environmental & Hydraulic Services
5720 Capitol Blvd
Tumwater, WA 98501
P.O. Box 47440
Olympia, WA 98504-7440

360-570-6700 / Fax 360-357-2601
TTY: 1-800-833-6388
www.wsdot.wa.gov

November 8, 2017

The Honorable Frances Charles, Chair
Lower Elwha Klallam Tribe
2851 Lower Elwha Road
Port Angeles, WA 98363

RE: US 101 / Elwha River Bridge Replacement
Section 106 Consultation
Cultural Resources Survey Report and Archaeological Testing Plan

Dear ~~Chairwoman~~ Frances Charles:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), are continuing to develop this bridge replacement project. As you know, the initial cultural resource field survey conducted this past August and September discovered three previously unrecorded sites and expanded one previously identified site. In order to fully evaluate National Register eligibility of these sites and assess potential for project impacts, we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We invite your review of the cultural resources survey report and archaeological testing plan prepared for the undertaking.

The proposed project will replace the existing US 101 Elwha River Bridge with a new bridge immediately north of the current highway alignment. Dam removals upriver and downriver from the bridge have resulted in significant erosion at the bridge foundations, undermining structural integrity and necessitating bridge replacement. The existing bridge and highway alignment will be used during construction to maintain traffic through the project. Once a new bridge and highway alignment are constructed, traffic will be shifted and the existing bridge will be removed. The project area of potential effects (APE) includes the existing WSDOT right-of-way as well as Olympic National Park-administered acreage, in Section 28, Township 30 N., Range 7 W., W.M.

Archaeological and Historical Services (AHS) has conducted an initial cultural resources survey of the project APE as described in the enclosed report, resulting in the identification of three previously unrecorded precontact sites (archaeological site 45CA775, site 45CA774, and isolate 45CA776) and expansion of the previously recorded precontact site 45CA727 boundary. Sites 45CA727, 45CA775, and 45CA774 are all precontact camps with varying degrees of integrity, and their assemblages primarily contain chipped stone artifacts, including tools suggesting multiple economic

traffic during construction and be removed after traffic had been shifted to the new bridge.

We initially define the APE as all areas where ground-disturbing activities associated with the bridge replacement are likely to occur as shown on the enclosed plan sheet, and any areas identified by the Tribe and the State Historic Preservation Officer. The enclosed APE is intended to encompass all three replacement options described above.

This project is also expected to require a permit from the U.S. Army Corps of Engineers (Corps). The Corps has designated FHWA to act on their behalf, and the Section 106 consultation will meet the Section 106 obligations of both the Corps and FHWA. Please be aware that the Corps will define the APE based on the Corps' regulated area of jurisdiction, so it may be smaller than the APE defined by WSDOT.

We ask that you comment on the enclosed draft APE, identify any traditional cultural properties that may exist within the project's APE, and identify any key tribal contacts. Should you have any comments regarding the draft APE, please provide a response by May 8, 2017, so we may discuss this undertaking and any identified areas of interest. Should you have any questions, please contact Randy Neff at 360-570-6705, or by e-mail at neffr@wsdot.wa.gov, or you may contact me directly at 360-570-6701.

Sincerely,

Karen I Boone

for Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures Purpose and Scope of Consultation
Vicinity Map
APE Map

cc w/enc: William S. White, Cultural Resources, Lower Elwha Klallam Tribe
Carol Brown, Planning, Lower Elwha Klallam Tribe
Robert Elofson, Natural Resources, Lower Elwha Klallam Tribe
Christopher Bruning, PEO, 47440-01, w/o enclosures
Roger Kiers, ESO, 47332, w/o enclosures
Project File

04072017 (7584)

PURPOSE AND SCOPE OF CONSULTATION

Through consultation, we want to ensure that the tribe is afforded the opportunity to identify any concerns you may have regarding the effects of the proposed undertaking on historic properties; that you have a reasonable opportunity to advise the Federal Highway Administration and the Washington State Department of Transportation on the identification and evaluation of historic properties, including those of traditional religious and cultural importance; that you have the opportunity to express your views on the undertaking's effects on such properties; and, that the tribe is a participant in the resolution of any adverse effects which the undertaking might have on such properties.

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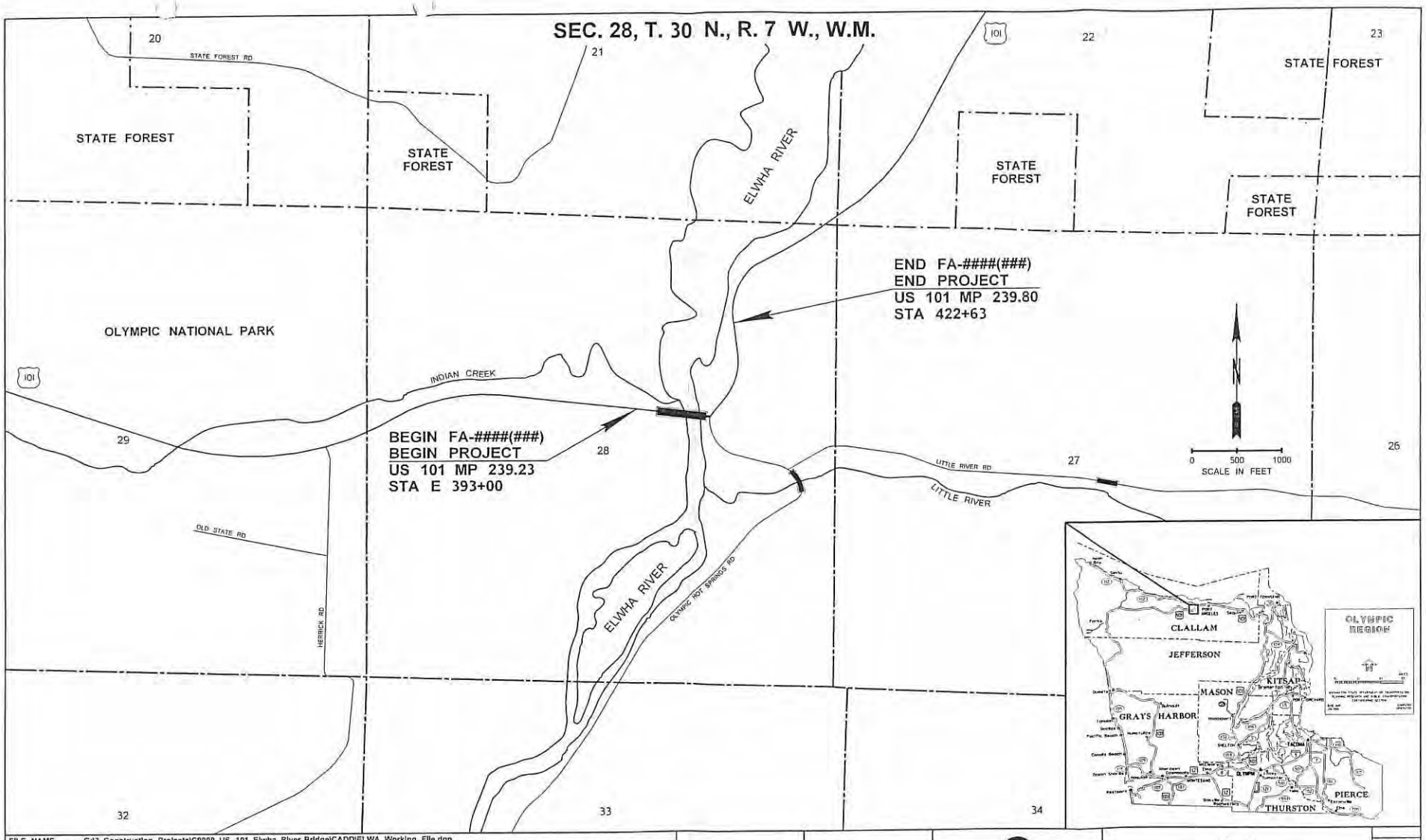

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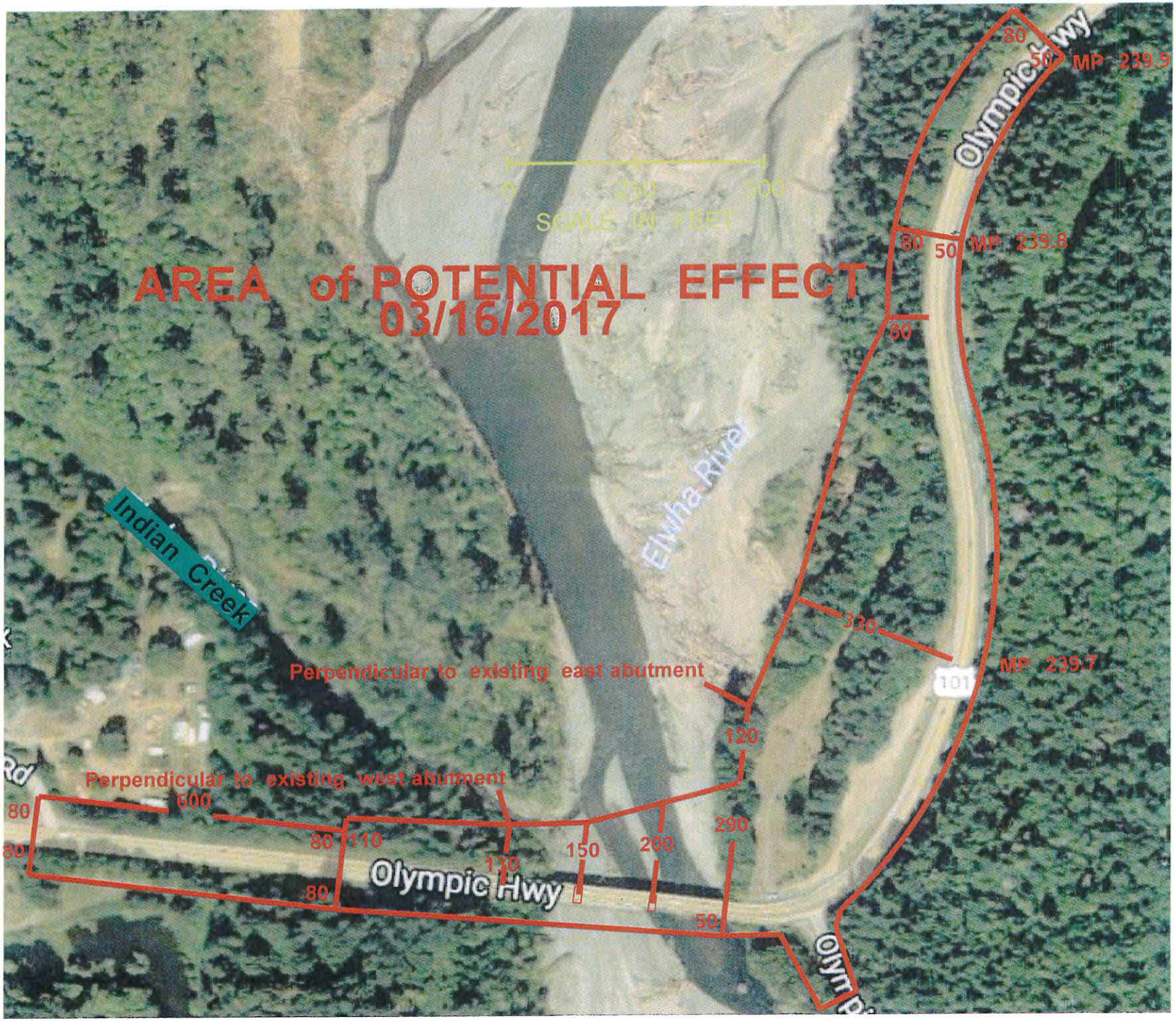
Washington State Department of Transportation

US 101
ELWHA RIVER BRIDGE
EMERGENCY SCOUR PROTECTION

VICINITY MAP

PLAN REF NO: VM1

SHEET OF SHEETS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Washington State Department of Transportation

Olympic Region
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360-570-6700 / Fax 360-357-2601
TTY: 1-800-833-6388
www.wsdot.wa.gov

April 7, 2017

The Honorable Marla Tolliver, Chairperson
Makah Nation
P.O. Box 115
Neah Bay, WA 98357

RE: US 101 / Elwha River Bridge – Replacement
Milepost (MP) 239.23 to MP 239.80
Section 106 Consultation

Dear Chairperson Tolliver:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is developing the subject project to address a transportation need in Clallam County. To ensure that WSDOT takes into account the effects of this undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places, WSDOT is initiating formal Section 106 Consultation pursuant to 36 CFR & 800.2(c)(4), under delegated authority from FHWA. We are inviting you to comment on the draft area of potential effects (APE) required under Section 106 of the National Historic Preservation Act (54 USC 300101) and 36 CFR 800.

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Sincerely,

Kevin D Boone

for Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures Purpose and Scope of Consultation
Vicinity Map
APE Map

cc w/enc: Janinne Ledford, THPO Cultural Resources, Makah Nation
Michelle Smith, Planning, Makah Nation
Rob McCoy, Natural Resources, Makah Nation
Christopher Bruning, PEO, 47440-01, w/o enclosures
Roger Kiers, ESO, 47330 w/o enclosures
Project File

SF04072017 (7582)

PURPOSE AND SCOPE OF CONSULTATION

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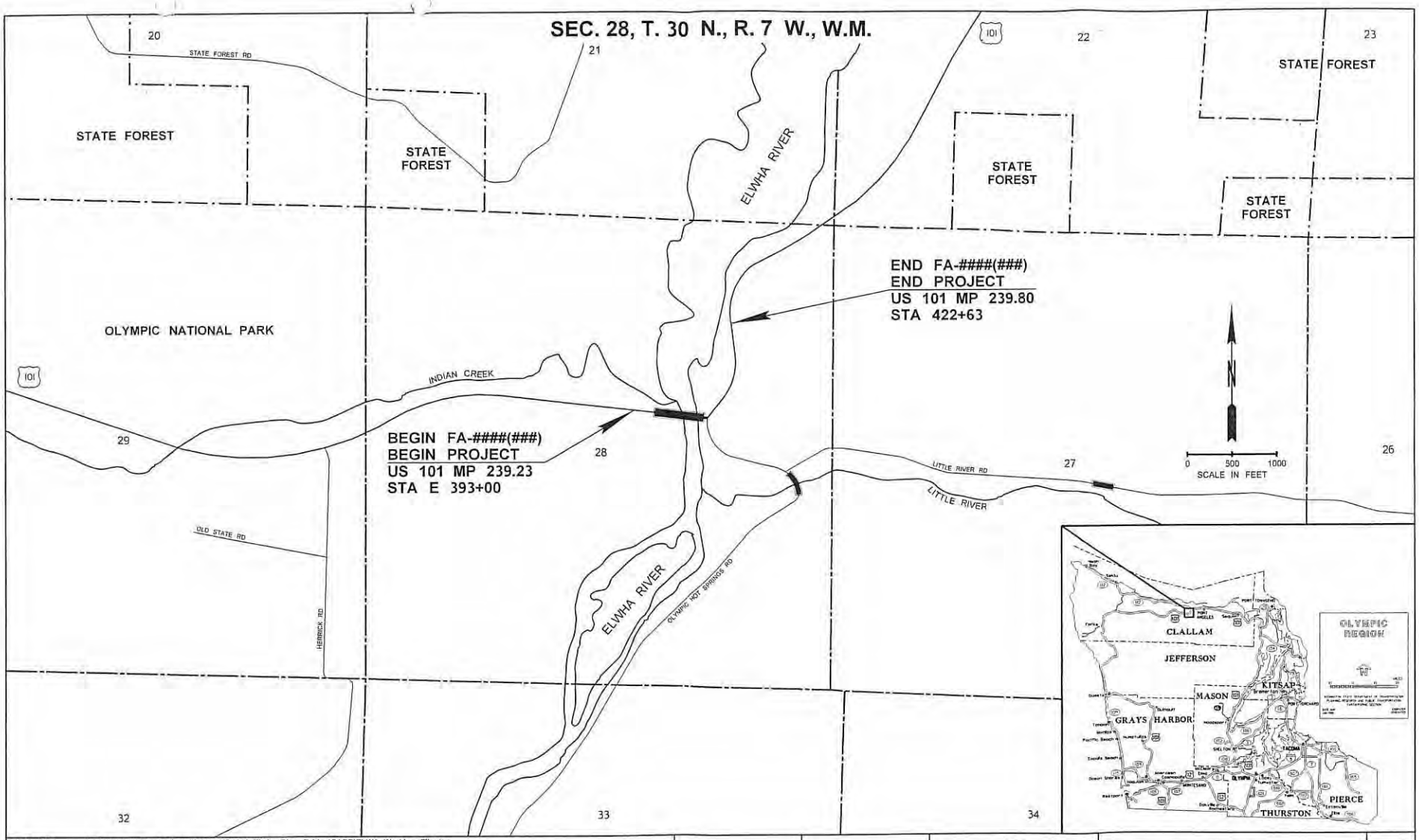

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Washington State Department of Transportation

US 101
ELWHA RIVER BRIDGE
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VICINITY MAP

PLAN REF NO
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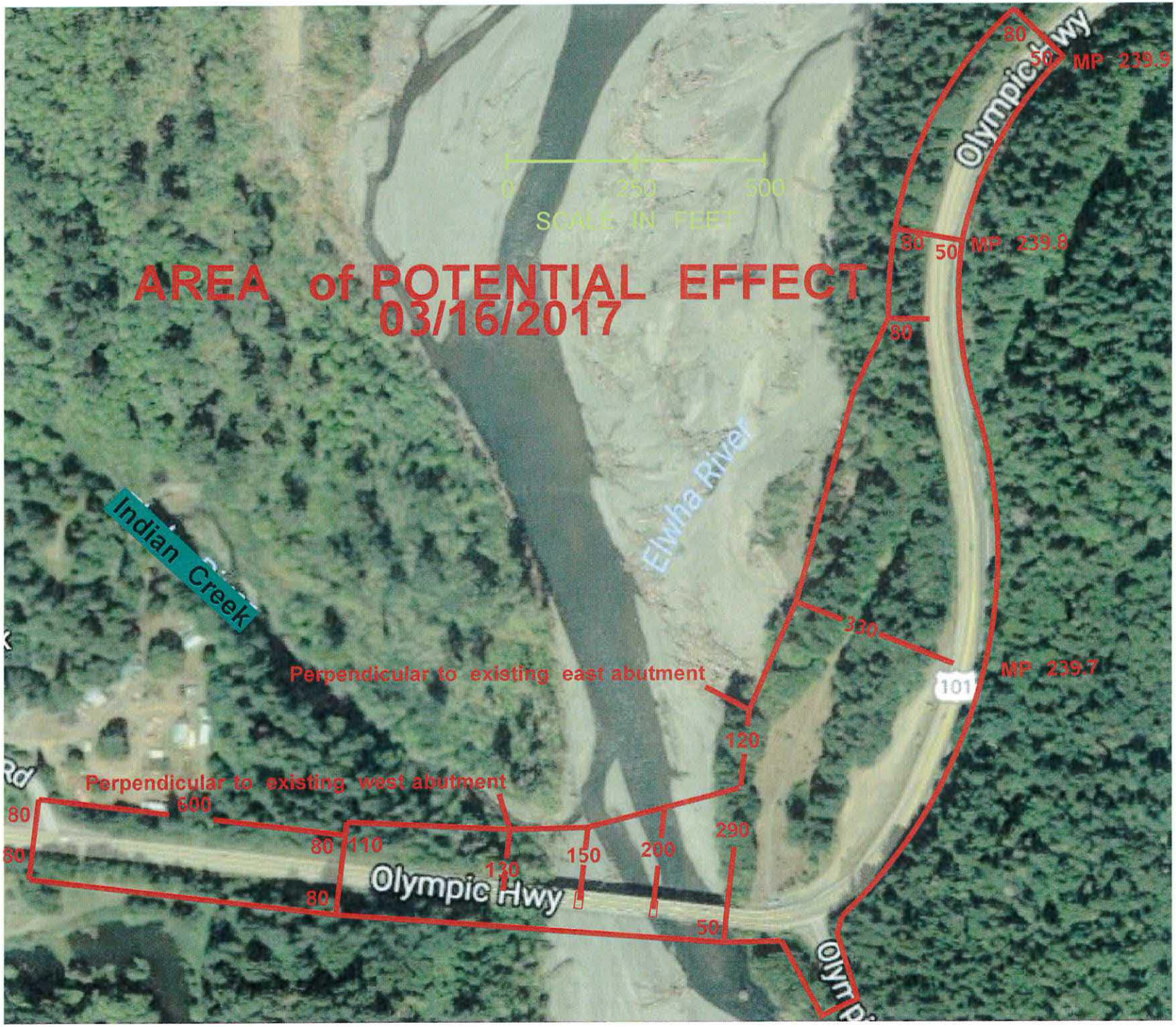
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TTY: 1-800-833-6388
www.wsdot.wa.gov

April 7, 2017

The Honorable Jeromy Sullivan, Chairperson
Port Gamble S'Klallam Tribe
31912 Little Boston Rd. N.E
Kingston, WA 98346

RE: US 101 / Elwha River Bridge – Replacement
Milepost (MP) 239.23 to MP 239.80
Section 106 Consultation

Dear Chairperson Sullivan:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is developing the subject project to address a transportation need in Clallam County. To ensure that WSDOT takes into account the effects of this undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places, WSDOT is initiating formal Section 106 Consultation pursuant to 36 CFR & 800.2(c)(4), under delegated authority from FHWA. We are inviting you to comment on the draft area of potential effects (APE) required under Section 106 of the National Historic Preservation Act (54 USC 300101) and 36 CFR 800.

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Sincerely,

Karen D Boone

for Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures Purpose and Scope of Consultation
Vicinity Map
APE Map

cc w/enc: Josh Wisniewski, Cultural Resources, Port Gamble S'Klallam Tribe
Joe Sparr, Planning, Port Gamble S'Klallam Tribe
Paul McCollum, Natural Resources, Port Gamble S'Klallam Tribe
Christopher Bruning, PEO, 47440-01, w/o enclosures
Roger Kiers, ESO, 47332 w/o enclosures
Project File

SF04072017 (7583)

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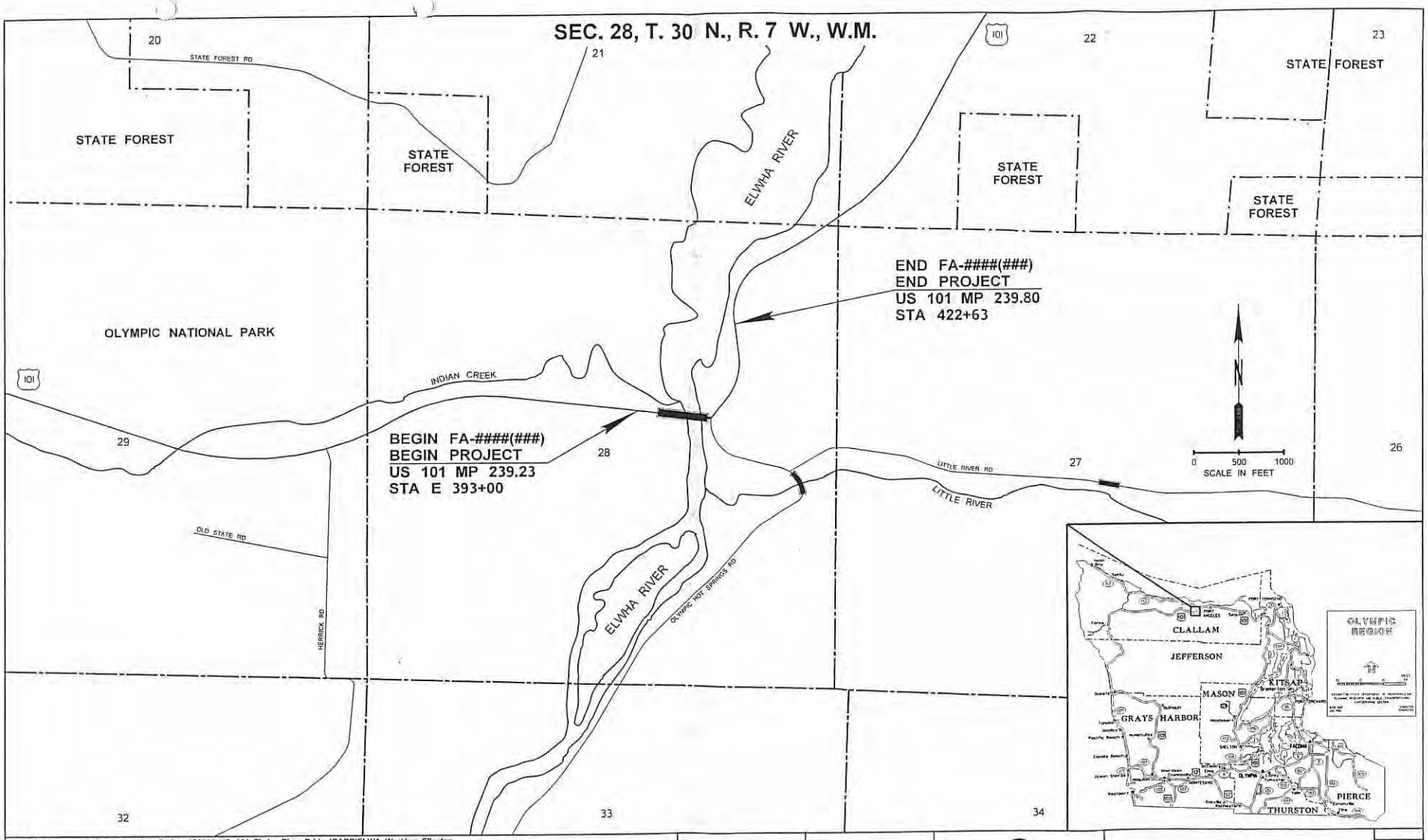

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Washington State Department of Transportation

US 101
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VICINITY MAP

PLAN REF NO. VM1

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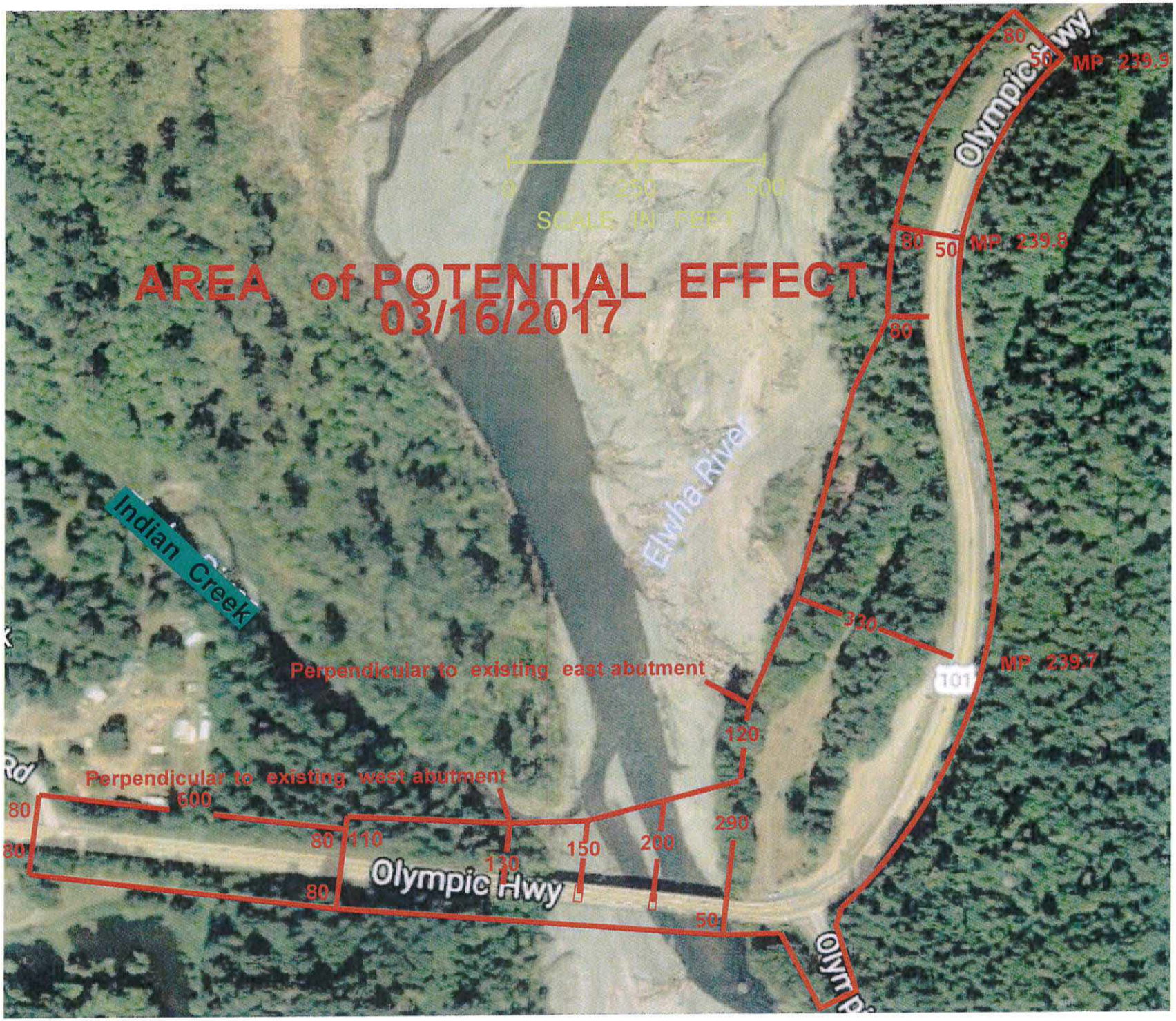
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April 7, 2017

The Honorable W. Ron Allen, Chairperson
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382

RE: US 101 / Elwha River Bridge – Replacement
Milepost (MP) 239.23 to MP 239.80
Section 106 Consultation

Dear Chairperson Allen:

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Sincerely,

Karen D Boone

for Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures: Purpose and Scope of Consultation
Vicinity Map
APE Map

cc w/enc: David Brownell, Cultural Resources, Jamestown S'Klallam Tribe
Annette Nesse, Planning & WITPAC, Jamestown S'Klallam Tribe
Scott Chitwood, Natural Resources, Jamestown S'Klallam Tribe
Christopher Bruning, PEO, 47440-01, w/o enclosures
Roger Kiers, ESO, 47332, w/o enclosures
Project File

SF04072017 (7585)

PURPOSE AND SCOPE OF CONSULTATION

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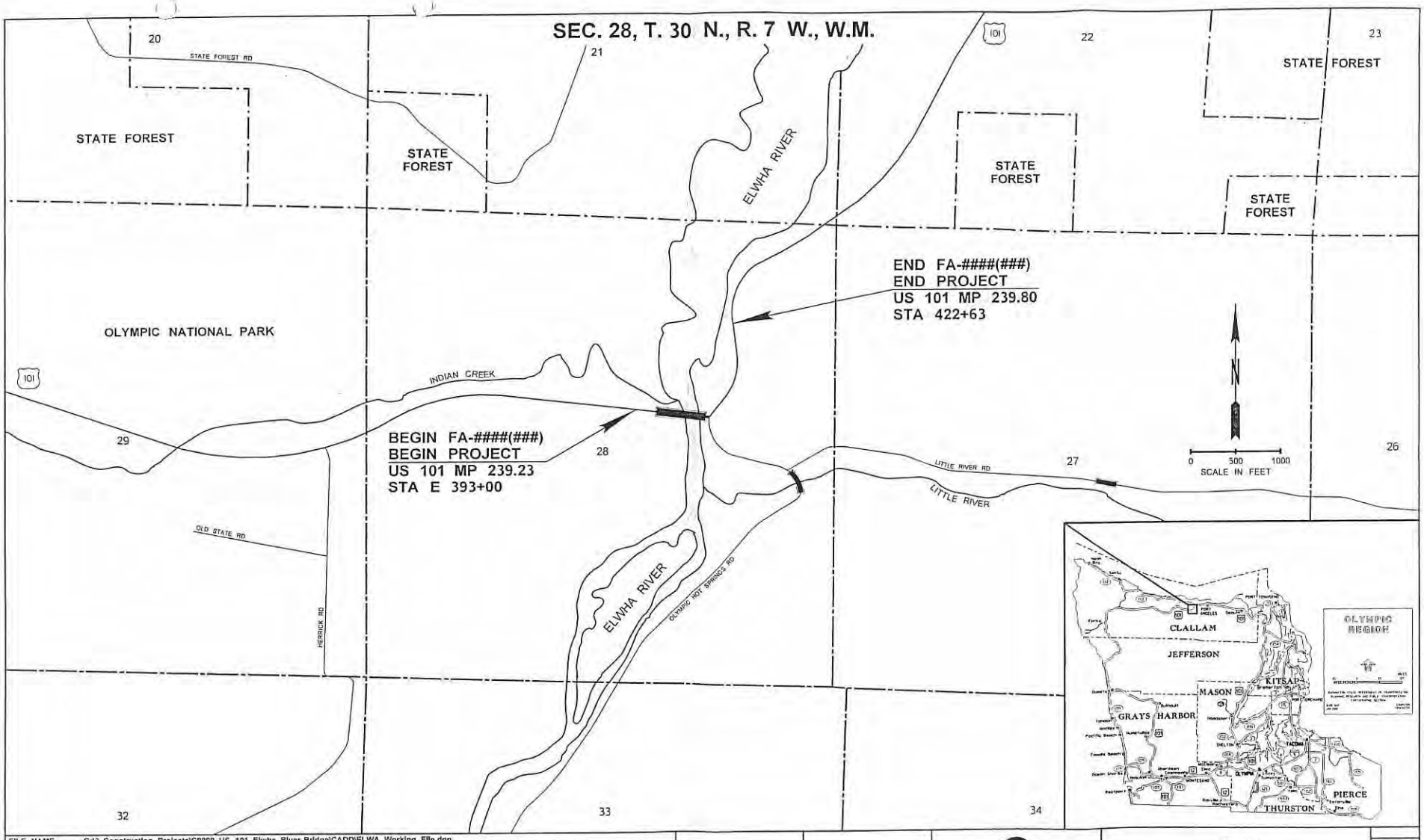

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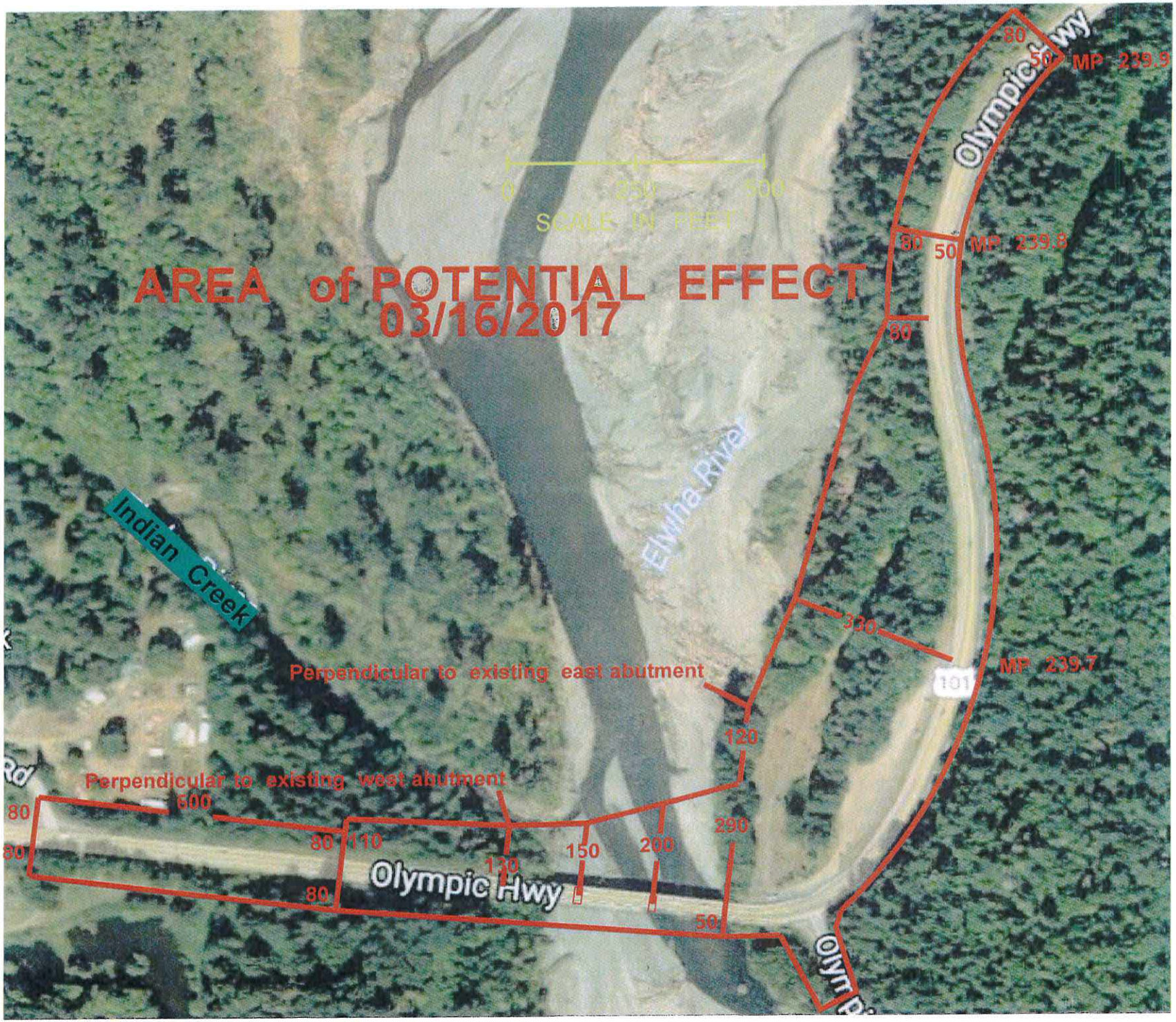
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LOWER ELWHA KLALLAM TRIBE

ʔəʔɬx̣ʷə nəxʷsƛ̓ay̓ əm "Strong People"

2851 Lower Elwha Road
Port Angeles, WA 98363

(360) 452-8471
Fax: (360) 452-3428

May 5, 2017

Jeff Sawyer
Olympic Region
Environmental and Hydraulic Services Office
5720 Capitol Blvd
Tumwater, WA 98501
PO Box 47440
Olympia, WA 98504-7440

Re: US 101, Elwha River Bridge - Replacement
Milepost (MP) 239.23 to MP 239.80
Section 106 Consultation

Dear Mr. Sawyer:

The Washington State Department of Transportation (WSDOT) recently advised the Lower Elwha Klallam Tribe's Cultural Resources Program of an identified transportation need in Clallam County, Washington. The proposed project will consist of the realignment of US 101over the Elwha River Bridge between the town of Forks and the city of Port Angeles. We are in receipt of your letter of April 7, 2017 advising us of the area of potential effect (APE) that has the potential of effecting historic and archaeological properties. The project is described as occurring between milepost 239.23 and 239.80. in Section 28, Township 30 N., Range 7 W. WM. The Area of Potential Effect identifies the mouth of Indian Creek as it enters the Elwha River where ground disturbance and bridge realignment along US 101 will occur. The Lower Elwha Klallam Tribe has also been informed of your request, to identify or provide comment on the prehistoric and historic properties within the area of potential effect (APE). After careful review of Lower Elwha Klallam Tribal archives and Washington State Department of Archaeology and Historic Preservation records we find that the proposed project lies near lands traditionally used by the Lower Elwha Klallam Tribe. Lower Elwha Tribal archives describe a permanent fishing village named Tee-tee-ulth as being located on the south bank of Indian Creek and west bank of the Elwha River (Swindell:1942). We therefore encourage your agency to coordinate with the Lower Elwha Klallam Tribe on a cultural resource monitoring plan with the Lower Elwha Klallam Tribe prior to any ground disturbing activities and provide us a current contact list for this project. Should archaeological or cultural resources be inadvertently discovered during this project the Lower Elwha Klallam Tribe will exercise its subsequent legal rights under the National Historic Preservation Act's Section 106 process to participate as a consulting party and provide direction and comment on this undertaking. Thank you again for the opportunity to provide comment on the proposed Area of Potential Effect for the US101, Elwha River Bridge replacement. Should you require additional information on this project I can be reached at (360) 460-1617.

Sincerely,

William S. White
Tribal Archaeologist, MA, RPA
Cultural Resources Department
Lower Elwha Klallam Tribe

cc: Frances Charles, Tribal Chairwoman
LEKT Business Committee
Michael Peters, Chief Executive Officer
File

Washington State Department of Transportation

Olympic Region
Environmental & Hydraulic Services
5720 Capitol Blvd
Tumwater, WA 98501
P.O. Box 47440
Olympia, WA 98504-7440

360-570-6700 / Fax 360-357-2601
TTY: 1-800-833-6388
www.wsdot.wa.gov

November 8, 2017

The Honorable Frances Charles, Chair
Lower Elwha Klallam Tribe
2851 Lower Elwha Road
Port Angeles, WA 98363

RE: US 101 / Elwha River Bridge Replacement
Section 106 Consultation
Cultural Resources Survey Report and Archaeological Testing Plan

Dear ~~Chairwoman~~ Frances Charles:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), are continuing to develop this bridge replacement project. As you know, the initial cultural resource field survey conducted this past August and September discovered three previously unrecorded sites and expanded one previously identified site. In order to fully evaluate National Register eligibility of these sites and assess potential for project impacts, we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We invite your review of the cultural resources survey report and archaeological testing plan prepared for the undertaking.

The proposed project will replace the existing US 101 Elwha River Bridge with a new bridge immediately north of the current highway alignment. Dam removals upriver and downriver from the bridge have resulted in significant erosion at the bridge foundations, undermining structural integrity and necessitating bridge replacement. The existing bridge and highway alignment will be used during construction to maintain traffic through the project. Once a new bridge and highway alignment are constructed, traffic will be shifted and the existing bridge will be removed. The project area of potential effects (APE) includes the existing WSDOT right-of-way as well as Olympic National Park-administered acreage, in Section 28, Township 30 N., Range 7 W., W.M.

Archaeological and Historical Services (AHS) has conducted an initial cultural resources survey of the project APE as described in the enclosed report, resulting in the identification of three previously unrecorded precontact sites (archaeological site 45CA775, site 45CA774, and isolate 45CA776) and expansion of the previously recorded precontact site 45CA727 boundary. Sites 45CA727, 45CA775, and 45CA774 are all precontact camps with varying degrees of integrity, and their assemblages primarily contain chipped stone artifacts, including tools suggesting multiple economic

activities. AHS recommends test excavations at the three sites to evaluate their NRHP eligibility. WSDOT proposes to proceed with additional testing, as described in the archaeological testing plan.

We request your review and comment on the enclosed cultural resources survey report and archaeological testing plan. We appreciate input and close coordination provided to date by Lower Elwha staff and look forward to finalizing the survey report and testing plan with your agreement over the next few weeks. Moving forward with additional field testing will include Tribal archaeological technicians identified by the Tribe and employed on site by AHS as we have been working toward. Should you have any questions, please feel free to contact me directly at 360-570-6701.

Sincerely,

Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures:

Cultural Resources Survey for the Washington State Department of Transportation's US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

Archaeological Test Excavation Plan for Site 45CA727, Site 45CA774, and Site 45CA775, US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

cc w/enc: Bill White, Cultural Resources, Lower Elwha Klallam Tribe
Christopher Bruning, WSDOT PEO, 47440, w/o enclosures
Roger Kiers, WSDOT ESO, 47332, w/o enclosures
Project File

SF11082017 (7700)

Washington State Department of Transportation

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www.wsdot.wa.gov

November 8, 2017

The Honorable Ron Allen, Chair
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382

RE: US 101 / Elwha River Bridge Replacement Section 106 Consultation, Cultural Resources Survey Report and Archaeological Testing Plan

Dear Chairperson Allen:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the subject project to address a transportation need in Clallam County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP), we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We invite your review of the cultural resources survey report, as well as the archaeological testing plan, prepared for the undertaking. Since the discovery of precontact cultural resources during the initial survey, we have been closely coordinating with the Lower Elwha Klallam Tribe.

The proposed project will replace the existing US 101 Elwha River Bridge with a new bridge immediately north of the current alignment. Dam removals upriver and downriver from the current bridge have resulted in significant erosion at the base of bridge foundations, necessitating bridge replacement. The existing bridge and roadway will be used during construction to keep traffic moving through the project. Once the bridge and roadway is constructed such that it can accommodate traffic, traffic will be shifted and the existing bridge will be removed. The project area of potential effects (APE) includes the WSDOT right-of-way as well as Olympic National Park-administered acreage, in Section 28, Township 30 N., Range 7 W., W.M.

Archaeological and Historical Services (AHS) has conducted a cultural resources survey of the project APE as described in the enclosed report, resulting in the identification of three previously unrecorded precontact cultural resources (archaeological site 45CA775, site 45CA774, and isolate 45CA776) and expansion of the previously recorded pre-contact site 45CA727 boundary. Sites 45CA727, 45CA775, and 45CA774 are all pre-contact camps with varying degrees of integrity, and their

assemblages primarily contain chipped stone artifacts, including tools suggesting multiple economic activities. AHS recommends test excavations at the three sites to evaluate their NRHP eligibility. WSDOT proposes to proceed with the archaeological testing, as described in the archaeological testing plan.

We request your review and comment on the enclosed cultural resources survey report and archaeological testing plan. Should you have any comments regarding the draft documents, please provide a response by December 10, 2017, so we may discuss this undertaking and any identified areas of interest. Should you have any questions, please contact Randy Neff at 360-570-6705, or by e-mail at neffr@wsdot.wa.gov, or you may contact me directly at 360-570-6701.

Sincerely,

Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures:

Cultural Resources Survey for the Washington State Department of Transportation's US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

Archaeological Test Excavation Plan for Site 45CA727, Site 45CA774, and Site 45CA775, US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

cc w/enc: David Brownell, Cultural Resources, Jamestown S'Klallam Tribe
Christopher Bruning, PEO, 47440, w/o enclosures
Roger Kiers, ESO, 47332, w/o enclosures
Project File

SF11082017 (7701)

Washington State Department of Transportation

Olympic Region
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Tumwater, WA 98501
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Olympia, WA 98504-7440

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TTY: 1-800-833-6388
www.wsdot.wa.gov

November 8, 2017

The Honorable Nathan Tyler, Chair
Makah Nation
P.O. Box 115
Neah Bay, WA 98357

RE: US 101 / Elwha River Bridge Replacement Section 106 Consultation, Cultural Resources Survey Report and Archaeological Testing Plan

Dear Chairperson Tyler:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the subject project to address a transportation need in Clallam County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP), we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We invite your review of the cultural resources survey report, as well as the archaeological testing plan, prepared for the undertaking. Since the discovery of precontact cultural resources during the initial survey, we have been closely coordinating with the Lower Elwha Klallam Tribe.

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We request your review and comment on the enclosed cultural resources survey report and archaeological testing plan. Should you have any comments regarding the draft documents, please provide a response by December 10, 2017, so we may discuss this undertaking and any identified areas of interest. Should you have any questions, please contact Randy Neff at 360-570-6705, or by e-mail at neffr@wsdot.wa.gov, or you may contact me directly at 360-570-6701.

Sincerely,

Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures:

Cultural Resources Survey for the Washington State Department of Transportation's US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

Archaeological Test Excavation Plan for Site 45CA727, Site 45CA774, and Site 45CA775, US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

cc w/enc: Janine Ledford, THPO Cultural Resources, Makah Nation
Christopher Bruning, PEO, 47440, w/o enclosures
Roger Kiers, ESO, 47332, w/o enclosures
Project File

SF11082017 (7702)

Washington State Department of Transportation

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TTY: 1-800-833-6388
www.wsdot.wa.gov

November 8, 2017

The Honorable Jeromy Sullivan, Chair
Port Gamble S'Klallam
31912 Little Boston Rd. NE
Kingston, WA 98346

RE: US 101 / Elwha River Bridge Replacement Section 106 Consultation, Cultural Resources Survey Report and Archaeological Testing Plan

Dear Chairperson Sullivan:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the subject project to address a transportation need in Clallam County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP), we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We invite your review of the cultural resources survey report, as well as the archaeological testing plan, prepared for the undertaking. Since the discovery of precontact cultural resources during the initial survey, we have been closely coordinating with the Lower Elwha Klallam Tribe.

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We request your review and comment on the enclosed cultural resources survey report and archaeological testing plan. Should you have any comments regarding the draft documents, please provide a response by December 10, 2017, so we may discuss this undertaking and any identified areas of interest. Should you have any questions, please contact Randy Neff at 360-570-6705, or by e-mail at neffr@wsdot.wa.gov, or you may contact me directly at 360-570-6701.

Sincerely,

Jeff Sawyer
Environmental & Hydraulic Manager
Olympic Region

JBS:rn:ip
Enclosures:

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Archaeological Test Excavation Plan for Site 45CA727, Site 45CA774, and Site 45CA775, US 101 Elwha River Bridge Replacement Project, Clallam County, Washington, dated October 2017

cc w/enc: Stormy Purser, Cultural Resources, Port Gamble S'Klallam Tribe
Christopher Bruning, PEO, 47440, w/o enclosures
Roger Kiers, ESO, 47332, w/o enclosures
Project File

SF11082017 (7703)

SEC. 28, T.30N., R.7W., W.M.
CLALLAM COUNTY

US 101

494'-0" BK. TO BK. OF PAV'T SEATS MEASURED ALONG L LINE

180'-0" | 180'-0" | 134'-0"

25'-0" MIN. (TYP.) MEASURED ALONG LEFT CURB LINE

8'-0" CURTAIN WALL

50'-0" RETAINING WALL (MEASURED ALONG CURB LINE)

10°31'07" SKEW

BRIDGE APPROACH SLAB (TYP.)

PIGMENTED SEALER

EDGE OF PAVED SHOULDER

TO JCT. SR 113
35.4 MILES

8'-0" SHLD

40'-0" BRIDGE ROADWAY

12' LN | 12' LN

8'-0" SHLD

EDGE OF PAVED SHOULDER

PT. OF MIN. VERT. CLR.
L STA. 61+20.0 (19.2' LT.)

PT. OF MIN. VERT. CLR.

L STA. 61+14.00 P.T.

TOP OF BANK

INDIAN CREEK

12°00'00" SKEW

PROFILE GRADE & PIVOT POINT

SLOPE VARIES

L LINE
N 77°57'11" E

3'-10" (TYP.)

61 | 62 | 63 | 64

US 101

N 0°01'02" E

EDGE OF PED PATH

TOP OF BANK

12°00'00" SKEW

P STA. 23+16.13 P.C.

L STA. 65+60.90 P.O.T. =
P STA. 22+83.33 P.O.T.

12°00'00" SKEW

P STA. 23+72.83 P.T.

P LINE
N 46°25'36" E

L STA. 66+79.20 P.C.

R=70'

77°56'10"

90° (TYP.)

L STA. 66+21.24
(21.11' LT.)

TO JCT. SR 112
3.1 MILES

L STA. 66+12.44
(25.13' RT.)

R=100'

22

TOE OF FILL (TYP.)

35'-0" RETAINING WALL MEASURED ALONG CURB LINE (TYP. AT PIER 4)

EDGE OF PAVED SHOULDER

20'-0" WINGWALL MEASURED ALONG CURB LINE

BANK BOTTOM

EXIST. BR. NO. 101/334
(TO BE REMOVED)

EDGE OF RIVER

ELWHA RIVER

P STA. 22+26.13 P.T.

10' PED PATH

8'-0" CURTAIN WALL MEASURED ALONG CURB LINE (TYP.)

F = FIXED

E = EXPANSION BEARING

Σ FRONT FACE OF ABUTMENT WALL

TP EXIST. TELEPHONE PEDESTAL (TO BE REMOVED)

EXIST. UTILITY POLE

EXIST. POWER POLE

ø BRIDGE RAILING TYPE BP

β 2 ~ 2"ø CONDUIT PIPES IN TRAFFIC BARRIER FOR FULL LENGTH OF BARRIER

SOIL BORING LOCATIONS

Ω BEAM GUARDRAIL CONNECTION TYPE "D" (STD. PLAN C-24.10-01)

PLAN

BEARING OF PIERS IS N 0°02'49" W

BK. OF PAV'T SEAT
PIER 1
L STA. 60+80.00
GR. ELEV. 232.63

℄ PIER 2
L STA. 62+60.00
GR. ELEV. 237.46

FRACTURED FIN FINISH W/ PIGMENTED SEALER

℄ PIER 3
L STA. 64+40.00
GR. ELEV. 242.28

BK. OF PAV'T SEAT
PIER 4
L STA. 65+74.00
GR. ELEV. 245.87

3.0' MIN.

MIN. VRT. CLR. = 23.2' TO 100 YR. M.R.I. W.S. ELEV.

NORMAL HIGH WATER W.S. ELEV. 197.8

13.0' MIN. (TYP. BOTH SIDES)

FRACTURED FIN FINISH W/ PIGMENTED SEALER

BRIDGE RAILING TYPE BP

+2.6799%

P.V.T.
L STA. 60+21.69
GR. ELEV. 231.07

P.V.C.
L STA. 69+11.69
GR. ELEV. 254.92

100 YR. M.R.I.
W.S. ELEV. 202.3
Q = 44,890 CFS

EL. 223.80

FRACTURED FIN FINISH W/ PIGMENTED SEALER (TYP. BOTH SIDES)

P LINE

PIGMENTED SEALER (TYP. BOTH SIDES)

2:1 MAX. SLOPE (TYP.)

EXISTING GROUND LINE ALONG LEFT CURB LINE

EXISTING GROUND LINE ALONG RIGHT CURB LINE

L LINE PROFILE

BRIDGE WITH APPROACH FILLS
WF83G P.C. GIRDERS
"A" DIMENSION 11" PRELIMINARY
DECK PROTECTIVE SYSTEM 1 (EPOXY COATED REBARS)
CAST-IN-PLACE CONCRETE STRENGTH SHALL BE 4000 PSI

COAST GUARD LIAISON GAW
COAST GUARD PERMIT NOT REQ'D
PERMIT TARGET DATE

PLAN APPROVED BY:

Bijan Khaleghi 6/17
BRIDGE DESIGN ENGINEER

PROJECT ENGINEER

DATUM
NAVD 88

REFERENCE LINE ELEVATION 150.0

ELEVATION
GRADE ELEVATIONS SHOWN ARE FINISH GRADES AT TOP OF BRIDGE DECK ON L LINE AND ARE EQUAL TO PROFILE GRADE.
SEE STD. PLAN A-50.20/A-50.10 FOR EMBANKMENT DETAILS AT BRIDGE ENDS.

NOTE: 500 YR M.R.I.
W.S. ELEV. 203.4
Q = 56,795 CFS

P.C. GIRDERS (WF83G)
LOADING: HL-93

Bridge Design Engr.	Khaleghi, B	6/17
Supervisor		
Designed By		
Checked By	Bauer, MH	6/17
Detailed By	Waldron, G	6/17
Bridge Projects Engr.		
Prelim. Plan By	Wei, J	6/17
Architect/Specialist	MJR/AJM/GAW	6/17

M:\PRELIMINARY PLANS\US 101 ELWHA RIVER BRIDGE\ELWAH LAYOUT.MAN

DATE	REVISION	BY	APP'D

REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10	WASH.			

JOB NUMBER

BRIDGE AND STRUCTURES OFFICE

BIJAN KHALEGHI — STATE OF WASHINGTON — 27990 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER

PRELIMINARY

Washington State Department of Transportation

NOT FOR CONSTRUCTION

PRELIMINARY PLAN

BRIDGE SHEET NO. 1

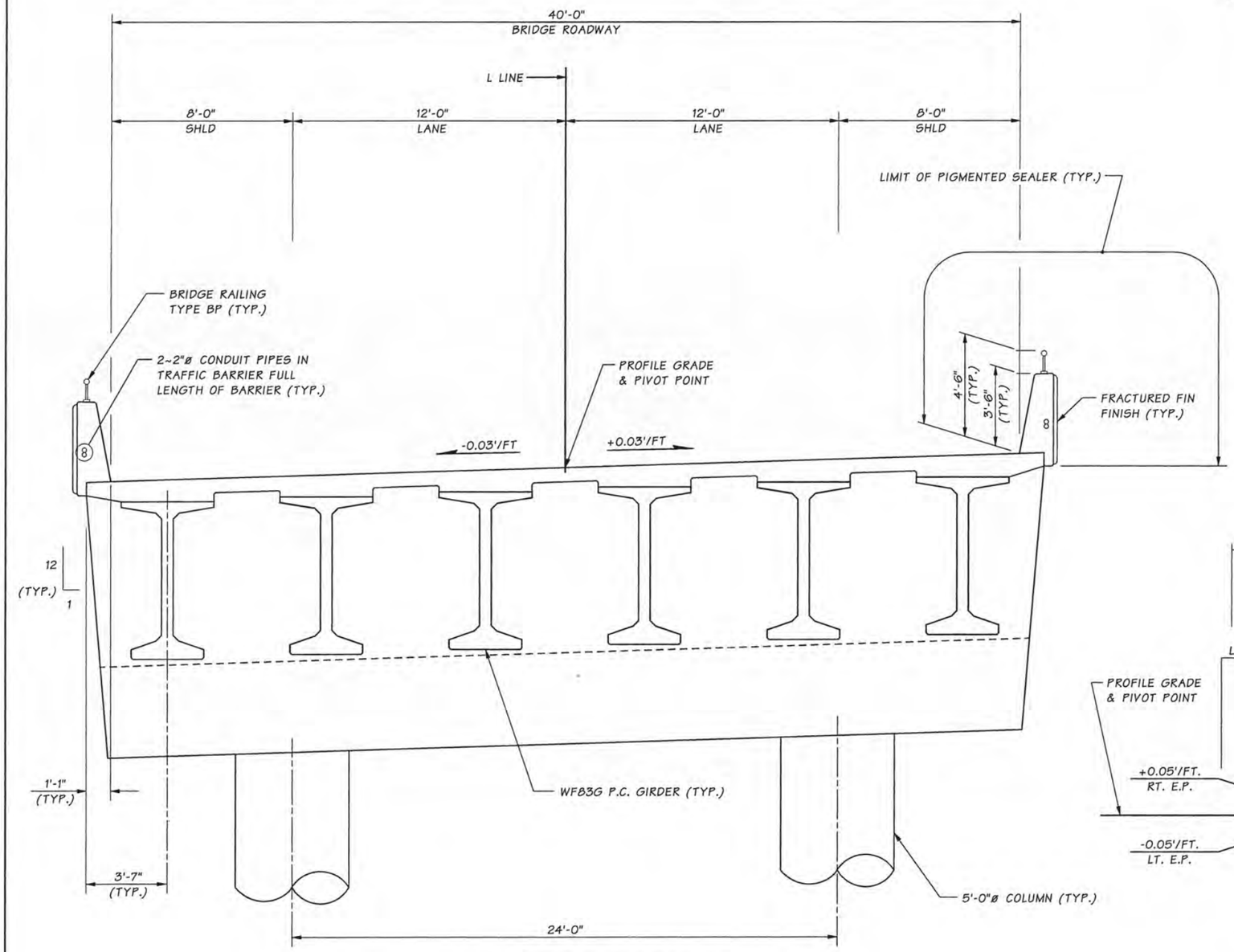
SHEET OF SHEETS

US 101 SHEET 1 OF 2

Mon Jul 31 07:28:02 2017

C.S. 0501 ~ PROJ. NO. XL5173 ~ OLYMPIC REGION ~ US 101 ~ MP 239.42 TO MP 239.50 ~ ELWHA RIVER (NEW STRUCTURE)

CURVE DATA					
P.I. STATION	Δ	RADIUS	TANGENT	LENGTH	BK. TANGENT BRG.
L 58+67.06	21°47'08" LT.	1315.00'	253.06'	500.00'	S 80°15'41" E
L 70+52.49	83°56'30" LT.	415.00'	373.29'	608.00'	N 77°57'11" E

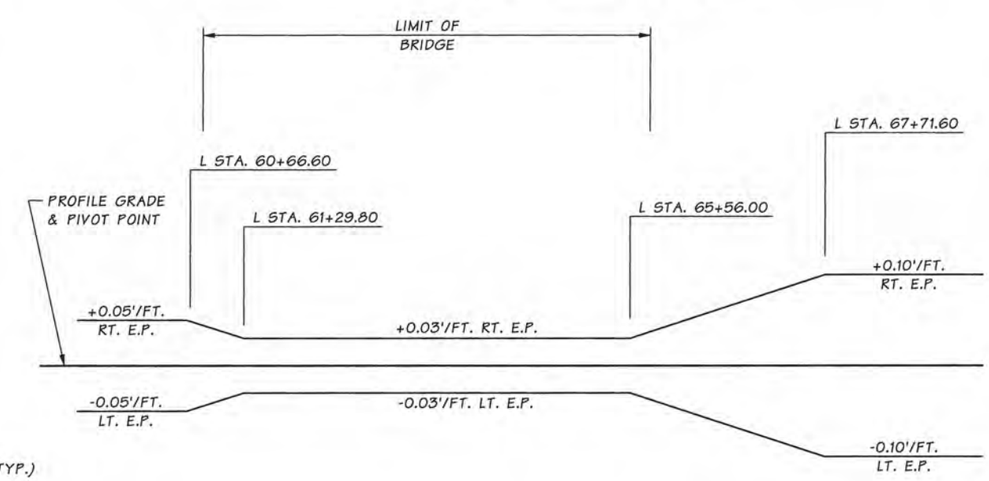


TYPICAL SECTION

SHOWN NEAR PIER 3
SUBSTRUCTURE DIMENSION IS APPROXIMATE

NOTES TO REGION

1. PLEASE VERIFY EXISTING UTILITY LINES IN THE VICINITY OF THE BRIDGE.
2. PLEASE VERIFY IF THERE WILL BE ANY PROPOSED NEW UTILITY LINES ON THE BRIDGE.
3. PLEASE VERIFY IF THERE WILL BE ANY NEW SIGNS OR LUMINAIRES MOUNTED ON THE BRIDGE. IF SO, PLEASE PROVIDE TYPE, SIZE AND LOCATION ON THE BRIDGE.
4. PLEASE VERIFY GUARDRAIL CONNECTION TYPE AT EACH END OF BRIDGE TRAFFIC BARRIER.
5. BRIDGE APPROACH SLABS ARE SHOWN WITH THE ROADWAY APPROACH ENDS NORMAL TO THE ROADWAY SURVEY LINE ALIGNMENT. DO YOU CONCUR?
6. PLEASE VERIFY IF RIPRAP WILL BE REQUIRED. IF SO, PLEASE PROVIDE DETAIL AND LIMITS.
7. BRIDGE ARCHITECT RECOMMENDS STANDARD WSDOT CONCRETE TEXTURES BE APPLIED TO THE ABUTMENT AND RETAINING WALL SURFACES FOR GRAFFITI MITIGATION. DOES THE REGION CONCUR?
8. ABUTMENT & RETAINING WALL TREATMENTS SHALL BE RE-EVALUATED IF THE OBSERVATION AREA AT THE EAST END OF BRIDGE IS TO BE REMAIN. PLEASE VERIFY IF A PEDESTRIAN PATH AND/OR OBSERVATION AREA WILL BE BUILT AT EAST END OF BRIDGE.



L LINE SUPERELEVATION DIAGRAM

Bridge Design Engr.	Khaleghi, B	6/17	M:\PRELIMINARY PLANS\US 101 ELWHA RIVER BRIDGE\ELWAH TYP SEC.MAN			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor						10	WASH.			
Designed By						JOB NUMBER				
Checked By	Bauer, MH	6/17								
Detailed By	Waldron, G	6/17								
Bridge Projects Engr.										
Prelim. Plan By	Wei, J	6/17								
Architect/Specialist	MJR/AJM/GAW	6/17	DATE	REVISION	BY	APP'D				

Mon Jul 31 07:27:10 2017

BRIDGE AND STRUCTURES OFFICE

BIJAN KHALEGHI STATE OF WASHINGTON 27695 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER

PRELIMINARY

Washington State Department of Transportation

NOT FOR CONSTRUCTION

PRELIMINARY PLAN

BRIDGE SHEET NO. 2

SHEET OF SHEETS

US 101 SHEET 2 OF 2

C.S. 0501 ~ PROJ. NO. XL5173 ~ OLYMPIC REGION ~ US 101 ~ MP 239.42 TO MP 239.50 ~ ELWAH RIVER (NEW STRUCTURE)

DRAFT SECTION 4(f) EVALUATION

US 101 Elwha River - Bridge Replacement
MP 239.23 – 239.94

Clallam County, WA

WSDOT OLYMPIC REGION

Environmental & Hydraulics Services Office

June 18, 2021

U. S. Department of Transportation
Federal Highway Administration

Washington State
Department of Transportation

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Chapter 1. Introduction

Section 4(f) of the Department of Transportation Act of 1966, codified in Federal law at 49 U.S.C. §303, declares that "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

The Section 4(f) regulation (23 CFR 774.3) requires that the proposed transportation use of any land from a significant publicly owned public park, recreation area, wildlife and waterfowl refuge, or public or private historic site that is on or eligible for the National Register of Historic Places (NRHP) be avoided, if avoidance is feasible and prudent, before any U.S. Department of Transportation (DOT) funding or approvals can be granted. Additionally, a full evaluation of measures to minimize harm to that property must be made and documented.

In general, a Section 4(f) use occurs when

1. Section 4(f) land is permanently incorporated into a transportation facility (permanent use);
2. There is a temporary occupancy of Section 4(f) land that is adverse in terms of the Section 4(f) preservation purposes (temporary occupancy); or
3. Section 4(f) land is not incorporated into the transportation project, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (constructive use).

This Section 4(f) Evaluation describes the Section 4(f) resources in the vicinity of the Elwha River Bridge, use of those resources by the Preferred Alternative and other build alternatives, avoidance alternatives, measures to minimize harm, an analysis of least overall harm, and a description of coordination efforts to protect Section 4(f) resources.

1.1 Location

The Elwha River bridge replacement project is located on United States (US) 101 from Mile Post (MP) 239.23 to MP 239.94. The project is within Clallam County (Sec. 28 T.30N R07W W.M.) (Figure 1). US 101 in Clallam County is a two-lane asphalt roadway that serves as a portion of a route circumnavigating the Olympic Peninsula.

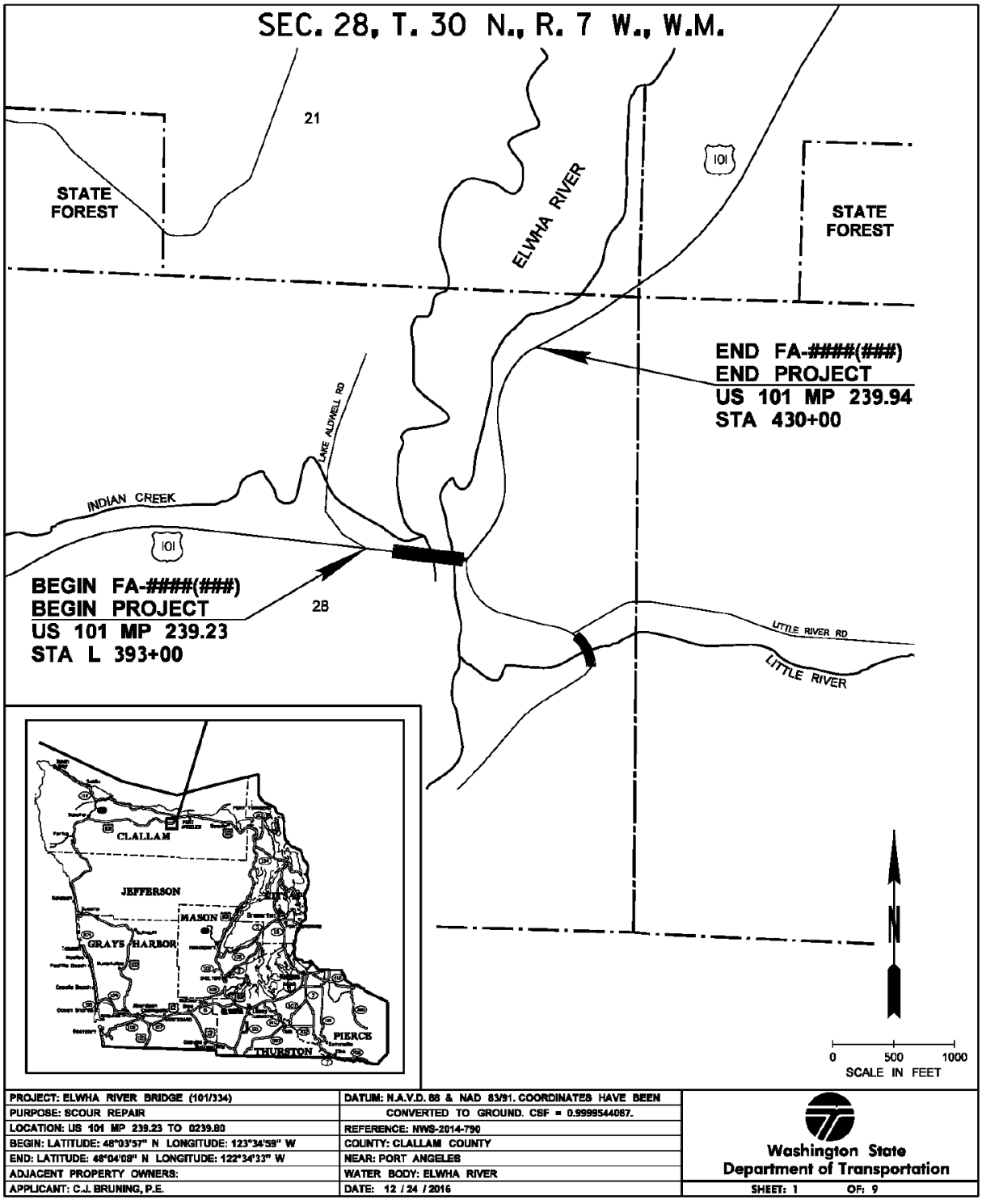


Figure 1. Vicinity Map

1.2 Background

Built in 1926, the three-span, 388-foot US 101 concrete arch bridge over the Elwha River has passed the end of its original design service life. The existing structure has two in-water piers—Pier 6 on the western side and Pier 7 on the eastern side. The bridge pier foundations were built on impounded gravels at the upstream end of the reservoir (Lake Aldwell) that formed after the construction of the Elwha Dam in 1913. Following construction of the Glines Canyon Dam in 1927, the river and bridge were not exposed to free-flowing river conditions for nearly 90 years. Following the removal of the Elwha Dam in 2012 and the Glines Canyon Dam in 2014, the Elwha River dramatically changed its course and flow, leading to severe erosion (scour) around the bridge pier foundations. Between 2012 and late 2016, the riverbed at the bridge lowered 14 feet due to the erosive forces of the restored river. While conducting fish habitat surveys in September 2016, Lower Elwha Klallam Tribe staff observed that Pier 7 was undermined, and Pier 6 was becoming exposed. WSDOT confirmed the observed erosion and conducted geotechnical borings in October 2016. The geotechnical borings discovered that, contrary to the depiction in the 1926 engineering plans, the bridge pier foundations were built on river bed gravel, not bedrock.

Initial emergency scour repair occurred in October 2016. Because of unusually high flows and additional scour at the bridge piers following the initial repair, additional scour protection was designed and permitted in 2017. The U.S. Army Corps of Engineers (Corps) was the lead federal action agency for the emergency repair and stabilization actions. As of May 2017, the initial emergency scour repair had successfully stabilized both piers from further scour, but additional protection was deemed necessary. WSDOT is monitoring the existing bridge and bridge piers for structural integrity and user safety until a replacement structure can be designed, permitted, and constructed.

The Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA) are co-leads for the National Environmental Policy Act (NEPA) Environmental Assessment (EA) for this project. The National Park Service (NPS) is a NEPA cooperating agency. While maintenance of the US 101 Elwha River Bridge is the responsibility of WSDOT, the NPS is responsible for managing the adjacent lands to the north and south of the bridge. The NPS has jurisdiction over actions on NPS lands and WSDOT has a highway easement over this section of US 101 and the Elwha River Bridge in its current location. The EA for this project, which evaluates impacts of the proposed project on natural, cultural and socioeconomic resources, visitor use and experience and park operations, will be used by FHWA to determine if there are significant impacts. If there are no significant impacts identified, FHWA will document this decision in a Finding of No Significant Impact (FONSI). Should the EA reveal significant impacts from the project, an Environmental Impact Statement and Record of Decision would be prepared.

1.3 Need and Purpose

Need

The existing 95-year-old 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. At the east approach, the substandard roadway geometrics and sight distance at the intersection with Hot Springs Road result in a high accident location.

Purpose

The purpose of the project is to provide safe, long term access across the Elwha River on US 101, which provides the primary highway access for the communities and visitors on the Olympic Peninsula.

Chapter 2. Alternative Descriptions

Short descriptions of eight alternatives considered for 4(f) analysis are provided below. A comparative analysis of the alternatives is provided in Table 1. Alternatives 2, 3, 4, 5, 6, 7 and 8 were advanced for further analysis in Chapters 4 and 5.

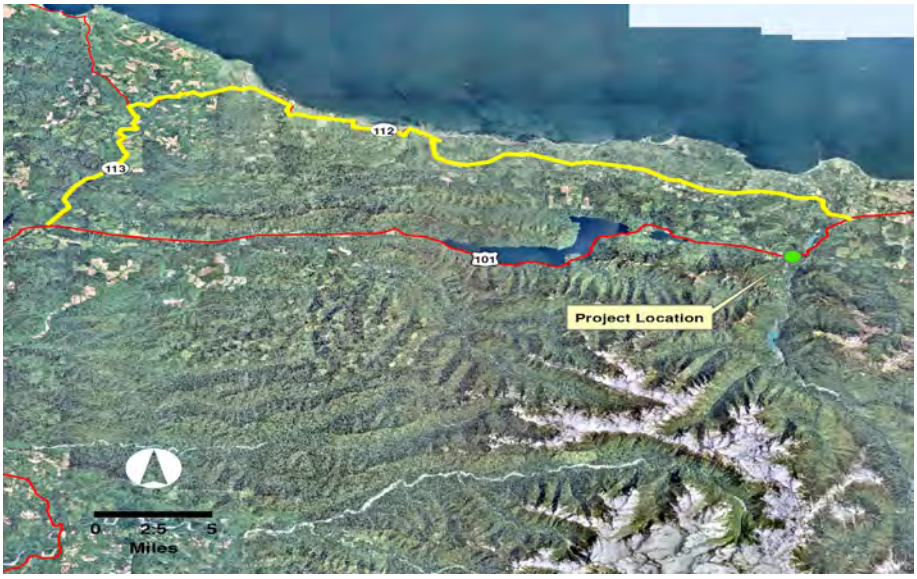
2.1 No Build Alternative

Alternative 1: The US 101 Elwha River Bridge would remain open until monitoring determines it to be structurally unsound and not safe for the traveling public. WSDOT's current management strategy is to monitor bridge stability using remote sensing, visual structural inspections at an increased frequency, daily monitoring of river flows and development of a rapid response plan to close the bridge and implement a temporary detour if needed. Should monitoring show movement beyond established thresholds, immediate bridge closure and implementation of a preplanned detour would occur. Further structural failure could possibly result in additional temporary bridge stabilization response measures. The scope and scale of these responsive measures cannot be fully envisioned in advance. Eventual controlled bridge removal would be likely. The current operational baseline is to manage and operate the structurally deficient bridge for as long as safely possible. Should controlled bridge removal be necessary with this alternative, Section 4(f) use of adjacent archaeological sites would result. Demolition equipment access to the River would require access road development through and across these archaeological sites.

2.2 Build Alternatives and their Use of Section 4(f) Resources

Alternative 2

Description: This portion of US 101 would be abandoned, and the Elwha River Bridge would be demolished due to the lack of structural integrity and need to address public safety. Traffic would be routed onto SR 112 and SR 113, which would be improved to better accommodate the increased traffic volumes. Necessary upgrades on the new route would require 2 to 5 years to complete, with full upgrades to National Highway System standards requiring up to 10 years to complete. The cost is estimated to be $40 to $50 million for immediate upgrades, and up to $95 million to reach full national highway standards.



Alternative 2

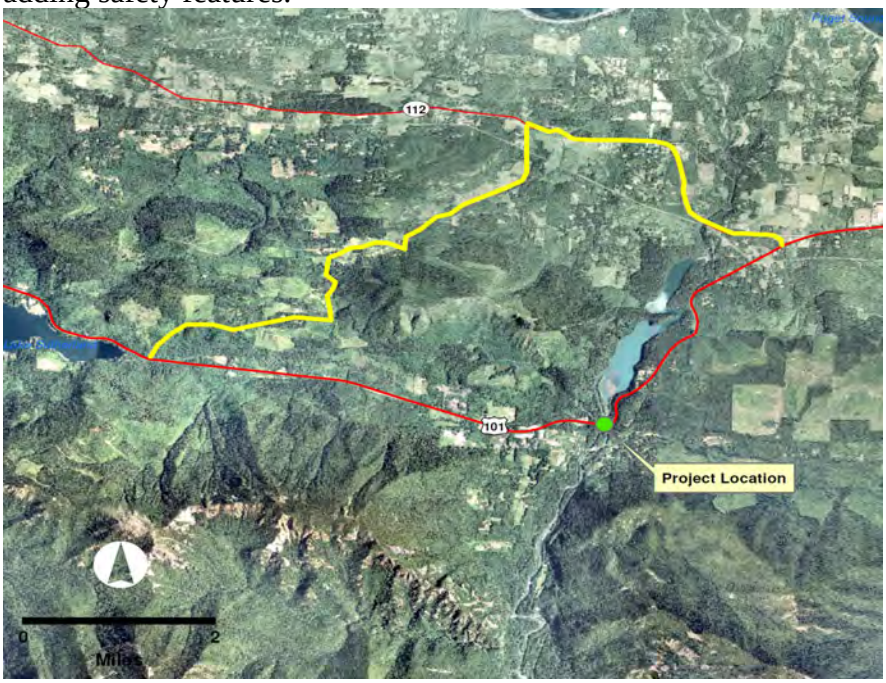
This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727 see Chapter 3 for descriptions) within the current APE due to bridge demolition. This alternative would result in unknown but likely impacts to 4(f) resources due to the upgrades to SR 112/113. The probability of cultural resources impact to areas outside the project APE were based largely on the Lower Elwha Klallam Tribe ethnographic record (Lane 1972) and on the Archeology Predictive Model Map included in Appendix B.

Schedule: 2 to 5 years to plan and construct necessary upgrades. 10 years for full NHS standards.

Cost: Immediate upgrades $40-$50 million. Up to $95 million to reach full NHS standards.

Alternative 3

WSDOT would construct a two-lane highway on or near the existing Eden Valley Road alignment (Clallam County road) between US 101 and SR 112. The existing Elwha River Bridge would be used until the new route was complete (assuming the bridge remains structurally sound), after which the bridge would be demolished due to public safety concerns due to its lack of structural integrity, along with the risk of environmental harm from collapse of the bridge. Traffic would be routed onto the new highway. WSDOT would also upgrade the existing US 101 and SR 112 intersection, including full reconstruction of the new intersection, repaving, and adding safety features.



Alternative 3

This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727).

Schedule: 2 to 3 years.

Cost: $35-$45 million.

Alternative 4: WSDOT would remove the Elwha River Bridge and build a new bridge at the same location. Existing traffic would be routed onto SR 112 and SR 113 through the construction phase.

Alternative 4

This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727).

Construction Schedule: 2 to 3 years.

Cost: $15-$20 million.

Alternative 5: WSDOT would remove the Elwha River Bridge and build a new bridge at the same location. A temporary bridge would be established parallel north or south of the existing bridge for use during construction of the new permanent bridge. After construction was complete, traffic would be diverted onto the new bridge and the temporary bridge would be removed.

Alternative 5

This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727) within the APE.

Construction Schedule: 2 to 3 years.

Cost: $17-$22 million.

Alternative 6: WSDOT would build a new bridge on a new alignment across the Elwha River well north of the existing bridge. The existing bridge would remain open to traffic during construction. After construction was complete, traffic would be shifted onto the new bridge and the old bridge would be removed. This alternative would include a bridge a substantial distance downstream of the existing bridge, for which a construction schedule and cost are not known. This alternative is considered to result in greater use of Section 4(f) resources due to the high likelihood of adverse effect to known and likely NRHP-eligible cultural resources located north of the existing US 101 Elwha River Bridge.

Alternative 6

This alternative would also result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727). The probability of cultural resources impact to areas outside the project APE were based largely on the Lower Elwha Klallam Tribe ethnographic record (Lane 1972) and on the Archeology Predictive Model Map included in Appendix B.

Schedule: Unknown

Cost: Unknown

Alternative 7: WSDOT would build a new bridge on a new alignment across the Elwha River south of the existing bridge. The existing bridge would remain open to traffic during construction. After construction was complete, traffic would be shifted onto the new bridge and the old bridge would be removed.

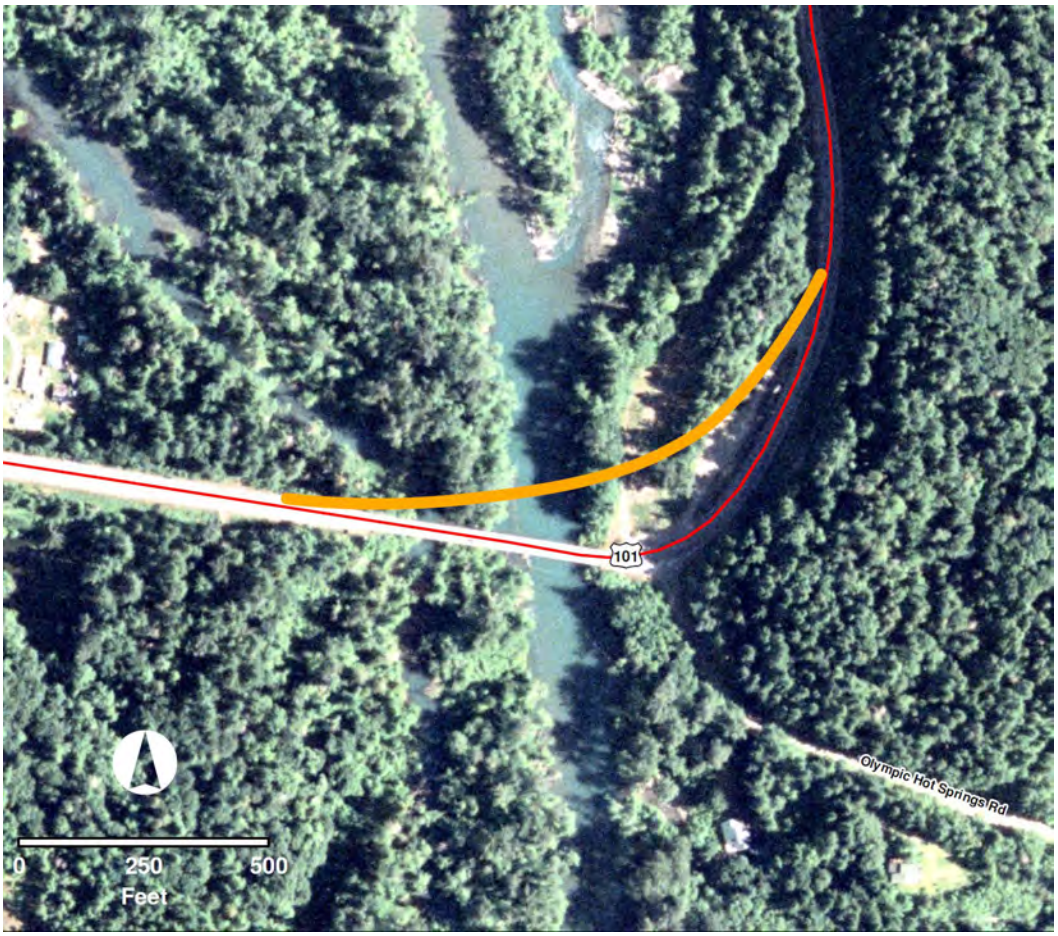
Alternative 7

This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727). The schedule and cost for this alternative are unknown. This alternative is considered to result in greater use of Section 4(f) resources due to the high likelihood of impacts to cultural resources as shown in Appendix B. The presence of large wetlands to the south of the existing US 101 Elwha River Bridge presents additional challenges to environmental review and permitting of this alternative.

Schedule: Unknown

Cost: Unknown

Alternative 8: WSDOT would build a new bridge on a new alignment just north of the existing bridge across the Elwha River. The existing bridge would remain open to traffic during construction. After construction was complete, traffic would be shifted onto the new bridge and the old bridge would be removed.



Alternative 8

This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727). The schedule for this alternative would be 2 to 3 years with an estimated cost of $18 to $25 million. This alternative would require reconstruction of the intersection of Olympic Hot Springs Road with US 101 and realignment of the eastern bridge approach to meet current design standards.

Schedule: 2 to 3 years.

Cost: $18-$25 million.

Chapter 3. Description of 4(f) Properties

The project is in an archeologically sensitive area with three discrete archeological sites identified within the project's Area of Potential Effect (APE). For archeological sites to qualify as Section 4(f) resources they must 1) be on or eligible for the national historic register, and 2) warrant preservation in place (23 CFR 774.13(b)). Sites 45CA727, 45CA774, and 45CA775 meet these requirements and are thus considered 4(f) resources (Figure 5). They are Olcott sites eligible for listing in the NRHP under Criteria A and D. The sites are eligible under Criterion A based on their proximity to the confluence of Indian Creek and the Elwha River, a location of cultural significance to the Lower Elwha Klallam Tribe (LEKT). They are eligible for Criterion D because of the likelihood of the property to yield information important to prehistory or history. The confluence represents a well-known fishing camp used for hundreds (if not thousands) of years by Klallam peoples. The confluence is the location of TiʔTiʔəɬ, a village site described in the ethnographic record (Lane 1972). As such, these sites are "*associated with events that have made a significant contribution to the broad patterns of our history*" in accordance with National Criteria for Evaluation (Criteria A).

3.1 Archeological Site # 45CA774

Site 45CA774 was recorded in 2017 during the survey for the Elwha River Bridge replacement project (Stcherbinine et al. 2017). The site is a pre-European contact camp that measures 190m by 60m within the project APE. The survey artifact assemblage consists of 89 artifacts. The site is an Olcott site with significant research potential based on the age of a diagnostic projectile point and a diverse artifact assemblage occurring within an intact sediment context. The site area is partially covered by the US 101 road prism. However, the site retains integrity and has not previously been disturbed in all tested areas north and south of the highway. Artifacts are concentrated in the shallow B horizon of an intact Pleistocene terrace, which suggests a single precontact site resulting from occupation after the landform geologically stabilized. (Stcherbinine et al. 2018)

Site 45CA775 is eligible for listing in the NRHP. Since intact, artifact-bearing sediments occur at the surface in all areas evaluated, ground disturbing activities at any location inside the site boundary have the potential to adversely affect intact cultural deposits at an eligible site. This is also true for areas underlying the current road prism. (Stcherbinine et al. 2018)

3.2 Archeological Site # 45CA775

Site 45CA775 was recorded in 2017 during the survey shovel testing for the Elwha River Bridge replacement project (Stcherbinine et al. 2017). The site is a pre-European contact camp that measures 100m by 70m. Artifacts recovered during testing consisted of 167 precontact artifacts. The site is an Olcott complex site generally spanning 6,000 to 12,000 year in age, with a large and diverse range of artifacts with significant research potential. Twenty percent of the artifact were recovered from fill or a disturbed sediment context. However, the remainder of the recovered artifacts were recovered from intact sediment. The site area has been heavily modified by modern land use yet retains depositional integrity beneath fill at several locations. Cultural material from the prehistoric occupation is concentrated in the shallow B horizon of a partially intact Pleistocene terrace, suggesting a single precontact site resulting from occupation after the landform geologically stabilized. (Stcherbinine et al. 2018)

Site 45CA775 is eligible for listing in the NRHP. North and west of US 101, intact cultural deposits occur at variable depths under fill, from near the current surface to around two meters below surface. Ground disturbing activities at any location inside the site boundary have the potential to adversely affect intact cultural deposits of an eligible site. (Stcherbinine et al. 2018)

3.3 Archeological Site # 45CA727

Site 45CA727 was recorded in 2014 as a surface scatter of 10 pieces of crystalline volcanic rock debitage associated with prehistoric tool making (Dubeau 2014). The site boundary was expanded to the south 180m as a result of the recovery of precontact cultural materials in 2017 shovel test excavations (Stcherbinine et al. 2017). The site boundary was further expanded south (by 25 m) during the current investigation due to the presence of precontact cultural materials during site testing. The site measures 300m by 50m. The southern 225 m of the site is within the

project APE; only this portion was assessed for NRHP eligibility during the January 2018 evaluative test excavations. The site is an Olcott complex site, which generally span 6,000 to 12,000 years in age. This site presents significant research potential based on temporally diagnostic projectile points and a large sample of diverse artifact types within an intact sediment context. The site location has been modified by modern land use. However, it retains depositional integrity, remaining intact beneath fill at several locations. Artifacts are concentrated in the shallow deposits of a mostly intact Pleistocene era terrace, suggesting a single precontact site resulting from occupation after the landform geologically stabilized. Additionally, the possibility exists that intact, artifact-bearing sediments could remain immediately south of site 45CA727, in areas with deep fill deposits that could not be adequately tested. (Stcherbinine et al. 2018)

Site 45CA727 is eligible for listing in the NRHP. Intact cultural deposits occur at ground surface, below one meter of fill, and potentially occur below one meter of fill. Ground disturbing activities at any location inside the site boundary have the potential to adversely affect intact cultural deposits of an eligible site. (Stcherbinine et al. 2018)

Chapter 4. Avoidance Alternatives

Each avoidance alternative is screened using a "prudent" and "feasible" test as defined in 23 CFR 774.17. An avoidance alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An avoidance alternative is not prudent if it:

- Compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- Results in unacceptable safety or operational problems;
- After reasonable mitigation, still causes:
    - Severe social, economic, or environmental impacts;
    - Severe disruption to established communities;
    - Severe disproportionate impacts to minority or low-income populations; or
    - Severe impacts to environmental resources protected under other Federal statutes.
- Results in additional construction, maintenance, or operational costs of an extraordinary magnitude:
- Causes other unique problems or unusual factors; or
- Involves multiple factors listed above that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

4.1 No Build Alternative

The No Build Alternative is the only alternative that avoids 4(f) resources.

Feasibility

This alternative is considered feasible as there are no unique engineering challenges associated with the No Build Alternative.

Prudence

This alternative would not meet the purpose and need for the project as it would not provide safe, sustainable route continuity for US 101 across the Elwha River and is therefore not prudent.

Chapter 5. Analysis of Least Overall Harm

If there is no feasible and prudent avoidance alternative, FHWA may approve the alternative that causes the least overall harm in light of the preservation purposes of Section 4(f) from among the alternatives that use Section 4(f) properties. The regulations in 23 CFR 774.3 (c) require that the identification of the alternative that causes the least overall harm be based upon an assessment and balancing of the following seven factors:

1. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
2. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
3. The relative significance of each Section 4(f) property;
4. The views of the officials with jurisdiction over each Section 4(f) property;
5. The degree to which each alternative meets the purpose and need for the project;
6. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
7. Substantial differences in costs among the alternatives.

As discussed in the Avoidance Alternatives chapter (Chapter 5) there is no feasible and prudent avoidance alternative for the project. Eight alternatives were evaluated. All of the Build Alternatives, 2, 3, 4, 5, 6, 7 and 8 would use one or more of the archeological NRHP eligible 4(f) resources. A least harm analysis comparing the Build Alternatives is presented below.

5.1 Least Harm Analysis

Factor 1 – The Ability to Mitigate Adverse Impacts

High impacts to 4(f) resources for Alternatives 6 and 7 are high probability according to the DAHP model (Appendix B) but are unknown, making an assessment of the ability to mitigate impacts for these alternatives difficult. Although the extent to which the 4(f) resources would be impacted by alternatives 4, 5, and 8 would differ somewhat between the alternatives, the "ability to mitigate adverse impacts" would be the same. The footprint of Alternative 8 encroaches more into NRHP eligible 4(f) resources but the impacts will be mitigated through Section 106 consultation. Mitigation of adverse effect to the archaeological sites would consist of data recovery, testing, analysis, reporting and artifact curation.

Alternatives 2 and 3, which reroute US 101 continuity to the north on SR 112/113 corridor would include impacts to the known archaeological sites at the existing River crossing and

inevitably impact cultural and natural resources on the SR 112/113 corridor alignment. Mitigation of the natural resource impacts, while costly in terms of time and budget would be conceivable by applying standard mitigation sequencing.

Additional mitigation actions and mitigation detail is provided in Chapter 7 of this document and in the Elwha Bridge Replacement MOA (Appendix A).

There would not be a difference among alternatives in the ability to mitigate adverse impacts to 4(f) resources.

Factor 2 - The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection

Alternatives 6 and 7 have the highest risk for high 4(f) impacts according to the DAHP probability model and would likely have the highest remaining harm. Alternative 4 would likely have the lowest remaining harm after mitigation of the eight alternatives. Alternative 5 would have the next lowest, and Alternative 8 would be next with slightly higher remaining harm. This is due to the fact that Alternative 8 involves an alignment that encroaches farther into the areas designated as 4(f) archeological sites than Alternatives 4 and 5. Alternative 8 also uniquely includes a parking lot and retaining wall that encroach upon archeological sites 45CA775 and 45CA727 respectively.

Table 1: Remaining Harm After Mitigation for all build alternatives

	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 8
Archeological Site # 45CA774	Unknown but likely High	Unknown but likely High	Lowest	Lower	Highest	Highest	High
Archeological Site # 45CA775	Unknown but likely High	Unknown but likely High	Lowest	Lower	Highest	Highest	High
Archeological Site # 45CA727	Unknown but likely High	Unknown but likely High	Lowest	Lower	Highest	Highest	High

Factor 3 - The relative significance of each Section 4(f) property

According to the Cultural Resource Assessment for the project (Stcherbinine et. al. 2018), there is no difference in significance among the three archeological 4(f) resources identified in the project area. Each of the sites are considered Olcott Sites with large and diverse artifact assembles and significant resource potential. Ground disturbing activities at any location inside the site boundaries have the potential to adversely affect intact cultural deposits of an eligible site. (Stcherbinine et. al. 2018)

Factor 4 - The views of the officials with jurisdiction over each Section 4(f) Property

The official with jurisdiction over all of these Section 4(f) properties, the State Historic Preservation Officer (SHPO) was consulted to identify NRHP eligible 4(f) properties potentially affected by the project and was further consulted regarding determinations of effect on such properties. As a consulting party and official with jurisdiction over archeological sites 45CL727, 45CL774, 45CL775 the SHPO has agreed to the project undertaking as long is its implementation is in accordance with the project Section 106 Memorandum of Agreement (MOA) (FHWA, NPS, SHPO, LEKT 2019). The signed MOA is included in Appendix A.

Factor 5 - The degree to which each alternative meets the need and purpose for the project

Alternatives 6 and 7 would meet the need and purpose of the project. In concept, they would each provide safe long-term access across the Elwha River on US 101.

Alternative 4 has several deficiencies concerning the need and purpose of the project. While the new bridge is under construction, the SR 112 and SR 113 detour would result in lengthened travel times for the travelling public due to the circuitous nature of SR 112 and 113. Travel time to some locations along US 101 near the existing bridge would be dramatically increased for that time period. Emergency response times to points west of the Elwha River would also increase while the detour is in place. The alternative also does not meet the safety element of the project need and purpose. Neither the hazardous highway geometrics at the bridge, nor the substandard angle and limited sight distance at the intersection of US 101 with Olympic Hotsprings Road would be addressed with Alternative 4.

As with Alternative 4, Alternative 5 does not meet the safety element of the project need and purpose. Neither the accident-prone highway geometrics at the bridge, or the intersection of US 101 with Olympic Hotsprings Road would be addressed with Alternative 5.

Alternative 8 also meets need and purpose of the project. The alignment of the replacement bridge will allow reconfiguration of the curve in US 101 at the eastern approach to the bridge. The intersection of Olympic Hot Springs Road with US 101, which is currently 100 feet east of the eastern end of the bridge, will be shifted approximately 400 feet east and north to meet the new alignment of US 101. These improvements will greatly enhance sight distance and highway geometrics with an expected outcome of a reduction in accidents at this currently unacceptably high accident location. The resulting condition of Alternative 8 is expected to be an improvement to safety, an important element of the project need and purpose.

Table 2: Comparison of the Elements of Need and Purpose for Each Build Alternative

	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 8
Bridge Safety (structural)	PASS Bridge Removed	PASS Bridge Removed	PASS Bridge Replaced	PASS Bridge Replaced	PASS Bridge Replaced	PASS Bridge Replaced	PASS Bridge Replaced
Roadway Safety Improvement (improved roadway alignment)	PASS Substandard curve on US 101 bypassed	PASS Substandard curve on US 101 bypassed	FAIL Bridge Replaced on same alignment	FAIL Bridge Replaced on same alignment	PASS New alignment built to current standards	PASS New alignment built to current standards	PASS New alignment built to current standards
Maintain/Improve Access (Travel Time, Emergency Access)	FAIL New route will have long lead time until safety upgrades are complete – finished route is longer and more circuitous Lower speed limit required	FAIL New route will have long lead time until safety upgrades are complete – finished route, though better than Alternative 2, is still longer and more circuitous	FAIL Restores road in current location, but has serious impacts on traffic during construction.	PASS Restores road in current location	PASS New route will maintain access and will not require extensive detour during construction	PASS New route will maintain access and will not require extensive detour during construction	PASS New route will maintain access and will not require extensive detour during construction
Intersection Safety – Hot	PASS Intersect	PASS Intersect	FAIL Intersecti	FAIL Intersect	PASS Intersect	PASS Intersect	PASS Intersect

Springs Road Substandard roadway geometrics and sight distance	ion with US 101 is removed	ion with US 101 is removed	on is not improved	ion is not improved	ion is corrected	ion is corrected	ion is corrected
Overall P&N determination	Does not fully meet P&N	Does not fully meet P&N	Does not fully meet P&N	Does not fully meet P&N	Meets P&N	Meets P&N	Meets P&N

Factor 6 - After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f)

Alternative 2 abandons the existing bridge and develops existing SR 112 to a higher design level as a functional replacement route for US 101. SR 112 experiences seasonal closures during the winter months due to unstable geologic conditions and frequent landslides. In order to provide an adequate level of service and all-weather route continuity reconstruction of the route would be necessary. In 2021, SR 112 experienced a 6-month closure due to landslide instability. While not evaluated in detail, this would entail substantial environmental impacts to resources not protected by Section 4(f).

Alternative 3 would abandon the existing bridge and develop an entirely new highway alignment following a low level of service route of logging and county roads. In order to provide an adequate level of service and all-weather route continuity design and construction would essentially require a new highway alignment be established on new location. While not evaluated in detail, this would entail substantial environmental impacts to resources not protected by Section 4(f).

Alternative 6 would include substantial impacts to resources not protected by Section 4(f). There is a high risk to wetland resources, floodplain resources, and Indian Creek, a tributary to the Elwha River. There would also likely be greater impacts than other alternatives to restored river aesthetics on NPS project land. There would also be greater impact to fishing, hunting, and ceremony uses from the presence of the large prominent bridge spanning the valley.

Alternative 7 would also include substantial impacts to resources not protected by Section 4(f). The primary concern of this alternative is the relatively higher risk to large size and high-quality wetlands and floodplains occurring south of the existing US 101 bridge. Impacts to these wetlands from Alternative 7 would be costly and difficult to mitigate.

Alternative 4 would also include substantial impacts to resources not protected by Section 4(f). This would be due to the long term but temporary use of SR 112 and SR 113 as the detour during construction of the new Elwha River Bridge. Impacts would include transportation and traffic impacts due to the longer travel times. Emergency response time to points west of the Elwha River would be increased. Mobility may also be affected by the lesser reliability of SR 112 which is more vulnerable to road closure due to unstable slopes and related hazards. There would

also be potential impacts to resources along SR 112 and SR 113 that have yet to be studied such as to wetlands, fish and wildlife, cultural resources, and the highway facility itself. Alternatives 5 and 8 have similar levels of impacts to resources not protected by Section 4(f), and these would be less than the impacts of Alternative 4,6, and 7.

Table 3: Magnitude of Adverse Effects to Resources not Protected by Section 4(f)

	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 8
Wetlands	High	High	Low	Low	High	High	Low
Fish/Wildlife/T&E Species	Very High	Very High	High	High	High	High	Medium
Water Resources	High	High	High	High	High	High	Medium
Geology	Very High*	Very High*	High	Low	Low	Medium	Low
ROW	High	High	Low	Low	High	High	Medium
Socio Economic	Medium	Medium	High	Low	Low	Medium	Low
Floodplains	Low	Low	High	Low	Low	High	Low

* Areas of extreme geologic instability

Factor 7 - Substantial differences in costs among the alternatives.

Table 4: Comparison of the Costs of Each Build Alternative

Build Alternative	**Approximate Cost**
Alt 2 – Replace US 101 with SR 112 and SR 113	$40-$135 million for work on SR 112 and 113, plus an additional $1.2 million for bridge removal
Alt 3 – Alternate highway west of SR 112	$35 - $45 million, plus an additional $1.2 million for bridge removal
Alt 4 - New Bridge on Existing Alignment (SR 112 & 113 Detour)	$15 - $20 million
Alt 5 - New Bridge on Existing Alignment (Temporary Bridge)	$15 - $20 million, plus $2-4 million for a temporary bridge
Alt 6 - New Bridge on New Alignment North of Existing Bridge	$30-35 million

Alt 7 - New Bridge on New Alignment South of Existing Bridge	$25-30 million
Alt 8 - New Bridge on New Alignment just North of Existing Bridge	$18 - $25 million

5.2 Least Harm Analysis Conclusion

Alternative 6 has a distinct disadvantage compared to other alternatives because of the high probability of impacts to cultural resources north of the existing US 101 bridge. This would also be the costliest bridge alternative due to the long span needed to cross the Elwha Valley.

Alternative 7 has a distinct disadvantage compared to other alternatives because of the high likelihood of incurring expansive impacts to large, high quality wetlands to the south of the existing US 101 bridge.

Alternatives 4 and 5 have an advantage over Alternative 8 in that they include somewhat lesser impacts to 4(f) resources. However, these two alternatives do not correct the dangerous curve alignment on US 101, and they fail to remedy the high accident conditions at the highway intersection with Olympic Hot Springs Road. Alternative 4 uniquely requires a long-term detour with resulting impacts to transportation and other resources not protected by 4(f). Alternative 5 uniquely involved additional impacts to in-water resources from the temporary bridge. There is also potential for the temporary bridge to destabilize the existing bridge during installation.

Alternative 8 alone includes safety benefits achieved through improved horizontal highway realignment and a relocated and improved intersection of US 101 with Olympic Hotsprings Road. The footprint of Alternative 8 encroaches more into NRHP eligible 4(f) resources but as discussed above, the impacts will be mitigated. Mitigation is expected to include limited data recovery, establishment of a tribally-owned curation facility, and the purchase of the Gustafson property for environmental mitigation. If a subsequent environmental feasibility study supports it, the Gustafson property will impart an opportunity for the Tribe to reroute Indian Creek into a historic channel, thus enhancing and expanded spawning opportunities for salmonids. Purchasing and/or conserving this property would also allow the Tribe to protect important cultural resources that are likely on the property. Additional mitigation actions and mitigation detail is provided in Chapter 7 of this document and in the Elwha Bridge Replacement MOA (Appendix A). There would not be a difference among alternatives in the ability to mitigate adverse impacts to 4(f) resources. In conclusion, after consideration of the seven least harm factors, FHWA has determined that Alternative 8 has the least overall harm.

Chapter 6. Measures to Minimize Harm

The following describes the measures to minimize harm to Section 4(f) resources in the vicinity of the project as agreed to in the Section 106 MOA. FHWA, WSDOT, and NPS shall ensure that the following measures are carried out:

i. Archaeological data recovery of sites 45CA727, 45CA774, and 45CA775 per the Archaeological Data Recovery Plan to be funded by FHWA and WSDOT for a cost not to exceed $524,100.

ii. Excavated collections will be held by the NPS at Olympic National Park in Port Angeles until the LEKT develops a facility that can house them. At that time, per 36 C.F.R. part 79, a collections management agreement will be drafted between the NPS and the LEKT for the NPS to convey custodial responsibilities for artifacts recovered from sites 45CA727, 45CA774, 45CA775 and any unanticipated archaeological finds made during construction, along with copies of associated documentation, to the LEKT.

iii. A Native American Graves Protection and Repatriation Act ("NAGPRA") inadvertent discovery plan, including reburial on site or at the Village of Tsewhitzen, in the sole discretion of the LEKT, will be produced by WSDOT prior to construction.

iv. Cultural Resource Monitors from the LEKT paid for by WSDOT and FHWA to observe all ground disturbing work, including any and all archeological data recovery.

v. The cooperation of NPS as landowner with the study and nomination of the valley from the Elwha River Bridge to the canyon downstream of the former dam site as a Traditional Cultural Property known as Indian Valley consisting of the Village of Tiʔ Tiʔəɬ, 45CA727, and the LEKT creation site/emergence place, with funding from WSDOT and FHWA, for a cost not to exceed $20,250.

Chapter 7. Coordination and Conclusion

7.1 Coordination

Tribal Coordination

Coordination and consultation with interested Tribes has been ongoing since project inception. FHWA and WSDOT initially consulted with the Lower Elwha Klallam Tribe (LEKT), the Jamestown S'Klallam Tribe (JST), and the Port Gamble S'Klallam Tribe (PGST), for which this project area near the confluence of Indian Creek with the Elwha River has religious and cultural significance. The JST and PGST have deferred to the LEKT. NRHP-eligible properties were officially documented in the summer of 2018. FHWA and WSDOT staff met with LEKT council members for 4(f) on August 24th, September 4th, and November 1st of 2018.

By early 2019, WSDOT anticipated that the project would adversely affect all three identified archeological sites. Comment on an archeological testing report and the WSDOT adverse effect determination was requested on April 29, 2019. A variety of meetings and correspondence

continued into 2019 with both LEKT council members and technical staff. In April, May, and June of 2019 bi-weekly meetings were held with representation from FHWA, WSDOT, NPS, and LEKT. The substance of these meetings focused on the development of an MOA with discussion that included research goals for data recovery and development of a data recovery plan. In a June 4, 2019 letter addressing WSDOT's application for Nationwide Permits 3 and 14, the Lower Elwha Klallam Tribe formally communicated the Tribes recognition of project vicinity areas as Traditional Cultural Property, "Indian Valley". Coordination and consultation continued with focus on development of the stipulations memorialized in the Elwha Bridge Replacement MOA (Appendix A). One notable aspect of the project that changed as a result of Tribal input was a drastic reduction in the volume of proposed data recovery that would be conducted as part of the project. The project will "preserve the physical features, artifacts, and any human remains in place to the greatest extent possible". Other stipulations included establishment of a tribally-owned curation facility and the purchase of the "Gustafson property" for environmental mitigation and cultural resource preservation. More detailed information about mitigation is included in the Section 106 MOA.

Agency Coordination
The State Historic Preservation Officer (SHPO) was consulted to identify NRHP eligible 4(f) properties potentially affected by the project and was further consulted regarding determinations of effect on such properties. As a consulting party and official with jurisdiction over archeological sites 45CL727, 45CL774, 45CL775 the SHPO has agreed to the project undertaking as long is its implementation is in compliance with the Section 106 Memorandum of Agreement (MOA). The fully executed MOA is included in Appendix A.

This Section 4(f) Evaluation will be submitted to DOI's Office of Environmental Compliance and Policy for review and comment.

7.2 Conclusion

Based on the above considerations, there is no feasible and prudent alternative to the use of Section 4(f) resources in the project area. Alternative 8 –New Bridge on New Alignment is identified as the alternative with the least overall harm, and the project includes all possible planning to minimize harm to Section 4(f) resources.

Chapter 8. References

Dubeau, Matthew. 2014. State of Washington Archeological Site Inventory Form – 45CA727. On file, Department of Archeology and Historic Preservation, Olympia.

Lane, Barbara. 1972. Summary of Anthropological Report in US v. Washington. On file, University of Washington Libraries, Seattle.

Stcherbinine, Sean and Noll, Christopher. 2018. Test Excavations of Sites 45CA727, 45CA774, and 45CA775 for the Washington State Department of Transportation US 101 Elwha River Bridge Replacement Project, Clallam County, Washington.

Lower Elwha Klallam Tribe (LEKT). 2019. Letter to the USACE Re: USACE Permit Notification, Reference # NWS-2018—0917-DOT. Dated June 4, 2019

Appendix A – Section 106 Memorandum of Agreement (MOA)

MEMORANDUM OF AGREEMENT

BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION, NATIONAL PARK SERVICE, WASHINGTON STATE HISTORIC PRESERVATION OFFICER, LOWER ELWHA KLALLAM TRIBE,

AND THE

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

REGARDING THE ELWHA BRIDGE REPLACEMENT PROJECT

WHEREAS the U.S. Department of Transportation, Federal Highway Administration (FHWA), has provided federal funding to the Washington State Department of Transportation (WSDOT) to replace the Elwha River Bridge (Bridge #101/334) in Clallam County; and

WHEREAS the undertaking consists of construction of a new bridge crossing the Elwha River on a new alignment, construction of new bridge approaches, improvements to the Hot Springs Road intersection, and demolition and removal of the existing bridge; and

WHEREAS, FHWA has defined the undertaking's area of potential effect (APE) as described in Attachment A; and

WHEREAS, the project area is on federal land under the management of the National Park Service (NPS); and

WHEREAS, the NPS enters into this agreement under the legal authority 54 U.S. Code § 100101 - Promotion and regulation: The Secretary, acting through the Director of the National Park Service, shall promote and regulate the use of the National Park System by means and measures that conform to the fundamental purpose of the System units, which purpose is to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

WHEREAS, FHWA has determined that the undertaking will have an adverse effect on archaeological sites 45CA727, 45CA774, and 45CA775, which are eligible for listing in the National Register of Historic Places, and has consulted with the Washington State Historic Preservation Officer (SHPO) pursuant to 36 C.F.R. part 800, of the regulations implementing Section 106 of the National Historic Preservation Act (54 U.S.C. 306108); and

WHEREAS, all parties acknowledge the excavations will generate a collection of artifacts, samples, and other documentation that need to be housed in an appropriate facility that

meets Department of the Interior Standards.

WHEREAS, FHWA has consulted with the Lower Elwha Klallam Tribe (LEKT), the Jamestown S'Klallam Tribe (JST), and the Port Gamble S'Klallam Tribe (PGST), for which sites 45CA727, 45CA774, and 45CA775 have religious and cultural significance, and has invited the LEKT to sign this Memorandum of Agreement (MOA) as an invited signatory, as the JST and PGST have deferred to the LEKT**;** and

WHEREAS, a Department of the Army permit, pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, is required from the United States Army Corps of Engineers, Seattle District Corps, to conduct activities related to the construction of the undertaking; and

WHEREAS, FHWA and the Corps have agreed that FHWA will act as Lead Federal agency for Section 106 compliance and will act on the Corps' behalf; and

WHEREAS, all parties acknowledge interest by a consulting party to recognize the historical use of the area (i.e., Old Elwha Resort), once disposition of the project lands are settled and if historical preservation programs become available in the future that could fund construction and maintenance of an interpretive kiosk; however, neither FHWA, NPS, nor WSDOT plan to construct or operate such a facility as part of the Elwha Bridge Replacement Project;

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), FHWA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

NOW, THEREFORE, **FHWA, NPS, LEKT, WSDOT, and the SHPO** agree that the undertaking shall be implemented in accordance with the following stipulations to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA, WSDOT, and NPS shall ensure that the following measures are carried out:

i. Archaeological data recovery of sites 45CA727, 45CA774, and 45CA775 per the attached Archaeological Data Recovery Plan (Attachment A), to be funded by FHWA and WSDOT for a cost not to exceed $524, 100.
ii. Excavated collections will be held by the NPS at Olympic National Park in Port Angeles until the LEKT develops a facility that can house them. At that time, per 36 C.F.R. part 79, a collections management agreement will be drafted between the NPS and the LEKT for the NPS to convey custodial responsibilities for artifacts recovered from sites 45CA727, 45CA774, 45CA775 and any

unanticipated archaeological finds made during construction, along with copies of associated documentation, to the LEKT.

iii. A Native American Graves Protection and Repatriation Act ("NAGPRA") inadvertent discovery plan, including reburial on site or at the Village of Tsewhitzen, in the sole discretion of the LEKT, will be produced by WSDOT prior to construction.

iv. Cultural Resource Monitors from the LEKT paid for by WSDOT and FHWA to observe all ground disturbing work, including any and all archeological data recovery.

v. The cooperation of NPS as landowner with the study and nomination of the valley from the Elwha River Bridge to the canyon downstream of the former dam site as a Traditional Cultural Property known as Indian Valley consisting of the Village of ***Ti?Ti?əɬ***, 45CA727, and the LEKT creation site/emergence place, with funding from WSDOT and FHWA, for a cost not to exceed $20, 250.

DURATION

This MOA will expire if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, FHWA may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with the Dispute Resolution section below.

POST-REVIEW DISCOVERIES

WSDOT will prepare an archaeological monitoring and unanticipated discovery plan, in consultation with the SHPO and LEKT, prior to commencement of project construction, and will report on the results of monitoring work when completed. The plan will outline procedures to be followed if significant, previously-undocumented site deposits, or other potential historic properties, are discovered during project construction.

MONITORING AND REPORTING

Each year following the execution of this MOA until it expires or is terminated, FHWA through WSDOT shall provide all parties to this MOA a summary report in the form of email detailing work undertaken pursuant to its terms. The report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in FHWA's efforts to carry out the terms of this MOA.

DISPUTE RESOLUTION

Should any signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, FHWA shall consult with such party to resolve the objection. If FHWA determines that such objection cannot be resolved, FHWA will:

A. Forward all documentation relevant to the dispute, including the FHWA’s proposed

resolution, to the ACHP. The ACHP shall provide FHWA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. FHWA will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

C. FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all the signatories is filed with the ACHP.

NON-FUNDING OBLIGATION FOR NPS OR UNITED STATES DEPARTMENT OF THE INTERIOR

Nothing in this agreement may be construed to obligate NPS or the United States Department of the Interior to any current or future expenditure of resources in advance of the availability of appropriations from Congress. Nor does this agreement obligate NPS or the Department to spend funds on any particular project or purpose, even if funds are available. To the extent NPS' participation in the MOA requires the transfer of funds, property, or services, the parties will enter into the appropriate agreement.

TERMINATION

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per the Amendment process outlined above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, FHWA must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. FHWA shall notify the signatories

as to the course of action it will pursue.

Execution of this MOA by the FHWA, NPS, LEKT, WSDOT, and SHPO and implementation of its terms evidence that FHWA and NPS have taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

DANIEL M MATHIS Digitally signed by DANIEL M MATHIS Date: 2021.04.21 10:41:03 -07'00' Date 4/21/21

Daniel Mathis, WA Division Administrator

National Park Service

_____ Date 4/5/21

Linda Walker, Acting Regional Director, Interior Regions 8, 9, 10, and 12

Washington State Historic Preservation Officer

_____ Date

Dr. Allyson Brooks, SHPO

INVITED SIGNATORIES:

Lower Elwha Klallam Tribe

_____ Date

Hon. Frances Charles, Chair

Washington State Department of Transportation

John Wynands Digitally signed by John Wynands Date: 2021.05.10 11:53:04 -07'00' Date

John Wynands, Olympic Region Administrator

as to the course of action it will pursue.

Execution of this MOA by the FHWA, NPS, LEKT, WSDOT, and SHPO and implementation of its terms evidence that FHWA and NPS have taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

_____ Date
Daniel Mathis, WA Division Administrator

National Park Service

LINDA WALKER Digitally signed by LINDA WALKER Date: 2021.04.05 17:54:44 -04'00' Date 4/5/21
Linda Walker, Acting Regional Director, Interior Regions 8, 9, 10, and 12

Washington State Historic Preservation Officer

DocuSigned by:
Allyson Brooks
E9C11C3BB8E24F6...
Date
Dr. Allyson Brooks, SHPO

INVITED SIGNATORIES:

Lower Elwha Klallam Tribe

_____ Date
Hon. Frances Charles, Chair

Washington State Department of Transportation

_____ Date
John Wynands, Olympic Region Administrator

as to the course of action it will pursue.

Execution of this MOA by the FHWA, NPS, LEKT, WSDOT, and SHPO and implementation of its terms evidence that FHWA and NPS have taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

_____ Date
Daniel Mathis, WA Division Administrator

National Park Service

_____ Date 4/5/21
Linda Walker, Acting Regional Director, Interior Regions 8, 9, 10, and 12

Washington State Historic Preservation Officer

_____ Date
Dr. Allyson Brooks, SHPO

INVITED SIGNATORIES:

Lower Elwha Klallam Tribe

Frances B. Charles _____ Date 04/12/2021
Hon. Frances Charles, Chair

Washington State Department of Transportation

_____ Date
John Wynands, Olympic Region Administrator

Mr. Ed B

Attachment A: Archaeological data recovery of sites 45CA727, 45CA774, and 45CA775

Data Recovery Plan for Sites 45CA727, 45CA774, and 45CA775

WSDOT US 101 Elwha Bridge Replacement Project

by Archaeological and Historical Services

Public Version

January 2020

Data Recovery Plan

WSDOT
US 101 Elwha Bridge Replacement
Data Recovery at Sites 45CA727, 45CA774, and 45CA775

Introduction

The Washington Department of Transportation (WSDOT) plans to replace the existing Elwha River Bridge (101/334) spanning the Elwha River near Indian Creek, in Clallam County, Washington. The undertaking requires WSDOT compliance with Section 106 of the National Historic Preservation Act. As part of the Section 106 process, three precontact archaeological sites (45CA727, 45CA774, and 45CA775) have been identified inside the project APE and all three are considered eligible for listing in the National Register of Historic Places (NRHP). Archaeological and Historical Services (AHS), Eastern Washington University, with assistance from tribal members and personnel from the Lower Elwha Klallam Tribe (LEKT) and Jamestown S'Klallam Tribe, have conducted the survey and the NRHP-evaluative testing at all three sites. AHS has prepared this data recovery plan based on available site information, regional literature, and as part of a collaborative process with the WSDOT, the LEKT, National Park Service (NPS), Department of Archaeology and Historic Preservation (DAHP), and Federal Highway Administration (FHWA).

While all three sites are disturbed to some extent, they all retain areas with intact cultural deposits. All three sites are eligible for listing in the NRHP under Criterion A for their association with the adjacent Indian Creek location and Criterion D for their research potential to further a better understanding of early to middle Holocene prehistory in the Elwha River valley and western Washington. Site 45CA727 is also eligible under Criterion B for its association with Hunter John, a Klallam chief/headman that oversaw Indian Creek as a Klallam fishery in the early 1900s.

The purpose of investigations outlined in this data recovery plan is to partially mitigate the adverse effects of bridge construction through the retrieval of significant site data from all three sites. Mitigation efforts may not be needed at site 45CA727 if WSDOT takes necessary steps to avoid any subsurface impact to the site during the bridge replacement project. The research questions posed below assume that all three assemblages (45CA727, 45CA774, and 45CA775) from all phases of investigations (i.e., survey, NRHP-evaluative testing, and data recovery excavations) will be used for analysis and interpretations. If site 45CA727 is omitted from the data recovery excavations, the artifact assemblage from the survey and NRHP-evaluative investigations will still be incorporated into the analysis and final data recovery report. Fieldwork will consist of 1) data recovery using archaeological excavation techniques and assistance from Klallam members; 2) archival and analysis of curated artifact assemblages; 3) geomorphological analysis of the site landforms; and, 4) analysis and reporting. A data recovery work plan to conduct work is outlined below. The plan presented below will guide the proposed fieldwork and analysis of recovered materials.

Background

All three sites are situated on Pleistocene terraces in the north-central Elwha River watershed, with some sediment integrity, despite significant disturbances. Site 45CA727 is a precontact camp location modified by modern land use. Previous work indicated the presence of intact sediments at many locations within the site. Site 45CA774 is a precontact camp location modified by road construction. This site contains intact sediments with soil horizonation in nearly all sampled locations outside the US 101 road prism. Site 45CA775 is a precontact camp in a location modified by modern land use. Previous investigations indicate intact sediments underlying resort-era fill deposits.

Site assemblages share characteristics with assemblages described as Olcott by other researchers, specifically the lanceolate projectile points and crystalline volcanic rock (cvr) debitage recovered from the B horizon of Pleistocene river terraces.

Recent investigations at sites 45CA727, 45CA774, and 45CA775 resulted in recovery of 2,163 total artifacts, including 93 lithic tools from approximately 21.16 m^3 of hand excavated sediment (Stcherbinine et al. 2018). The artifacts are almost all made from cvr, with small numbers of chert, chalcedony, fine-grained sedimentary stone, and obsidian tools and debitage. The tools include eight lanceolate projectile points, one specimen with a serrated blade. The cores at the three sites represent prepared bifacial and unidirectional forms as well as relatively informal multidirectional cores. The tool assemblage indicates that bifaces are a significant part of the Olcott toolkit but the assemblage suggests that biface production and maintenance was focused on tools and cores brought to the site from elsewhere, while the reduction of local stone was focused on the production of flake blanks and flake tools.

Inferred artifact functions from the assemblage recovered during these investigations are carving, projectile impact, flaking, pounding, and soft scraping. Indicated activities suggest short-duration hunting and processing camping areas of multiple or single occupations similar to other Olcott assemblages in western Washington dating between 6,000 and 10,000 years ago. The breadth of food processing in the Elwha Bridge replacement project APE is unknown due to the lack of hearths, ovens, fire-modified rock features, and faunal materials in the site assemblages, which is typical of most Olcott occupations (Blukis Onat et al. 2001; Ferris et al. 2010; Kidd 1964; Morgan 1999a; Samuels 1993).

Research Design and Questions

Sites 45CA727, 45CA774, and 45CA775 have the ability to contribute an important data set to the regional archaeological and paleoecology databases to better understand Olcott sites. All three sites are known to primarily contain lithic assemblages comprised of chipped stone artifacts. A number of limitations may adversely influence the excavation results including: (1) poor faunal and floral material preservation; (2) potentially destructive bioturbation characteristics of forested environments; (3) low density cultural material deposits; and, (4) limited information from site testing regarding feature presence.

The following research objectives at sites 45CA727, 45CA774, and 45CA775 are dependent upon the sampled site content, resulting data sets, and observations and analyses of these data sets. Data recovery excavations and planned analyses (see below) will contribute valuable information about the US 101 Elwha River sites as well as contribute to the regional literature regarding site formation, site age, paleoecology of the Olympic Peninsula, settlement and subsistence, trade, technology, and regional synthesis. To ensure maximum information gain from the planned data recovery at the US 101 Elwha River sites, a few research questions have been posed that incorporates off-site regional data (regional paleoecology) and analyses (lithic studies of select regional Olcott sites) that will supplement the recovered (Stcherbinine et al. 2017; Stcherbinine and Noll 2018) and anticipated artifact assemblages at each site.

Site Formation

1) The sites are situated on paired Elwha River terraces. What is the depositional history of the terraces and when did they stabilize?

The sites are situated on terrace treads at about 230 feet above sea level, located 25 feet above the current Elwha River gravelly floodplain. The terraces are mapped as older alluvium that formed during the late Pleistocene (Qoa), which contains "gravel, sand, silt, clay, and peat; variably sorted; loose; generally bedded; deposited in stream beds and estuaries and on flood plains; may include some lacustrine and beach deposits; mostly Olympic sediments; locally grades down into and may interfinger with recessional outwash and glaciomarine drift" (Polenz et al. 2004). Polenz et al. (2004) provides a conceptual model of landform development in the Elwha River area and is partially summarized below.

The Juan de Fuca Lobe's (JFL) furthest glacial advance through the Elwha River Valley occurred about 17,000 years before present (BP), terminating 2.3 miles south of the sites at 3,800 feet above sea level. Ice recession occurred between 14,500 and 14,000 BP, with deposition of glacial outwash in ice-free areas between about 14,500 and 12,000 BP. Some JFL ice at distance from the Elwha River may not have melted until as late as 8000 BP. Recessional outwash in the Elwha River area is rarely exposed because it was quickly obscured by subsequent deposition of Qoa (late Pleistocene alluvium) and Qa (Holocene alluvium).

The JFL lobe significantly depressed the earth's crust in the region. Rapid glacial melting at the time of JFL retreat caused relative sea levels to rise as melting outpaced crustal rebound, peaking around 13,000 BP at about 130 feet higher than modern sea level (MSL). This high drainage base level is thought to have controlled deposition of Qoa along the Elwha River, which would have been deposited in a floodplain setting between 14,500 and 10,700 BP. After 13,000 BP, crustal rebound in response to glacial unloading caused relative sea level to rapidly drop to about 200 ft below MSL. This triggered the cutting of steep-walled valleys and creation of terraces in the Elwha River Valley. High river terraces at about 220 foot elevations are thought to record the period of incision, which ended after 10,700 BP. Left high and dry, removed from major deposition, these Elwha River terraces would have been stable landforms suitable for human occupation. Such terraces would have weathered and formed prominent B horizons typical of soil formation on western Washington landforms stable for thousands of years.

Site stratigraphy consist of an almost ubiquitous A-B-C horizon soil sequence, with most of the archaeology located in the B horizon, which collectively overlay coarse gravels interpreted as late Pleistocene Elwha River channel deposits (Stcherbinine et al. 2017; Stcherbinine and Noll 2018). However, this stratigraphy was not always consistent between sites. Site 45CA727 contained a buried soil sequence and prominent A horizon, representing some hiatus in deposition and degree of landform stability during landform development. Additionally, some units contained basal deposits that were sandy with smaller gravels, possibly consisting of recessional outwash known to be masked by Qoa deposits.

The creation of a depositional history model for the site and Indian Creek area would test and refine the regional Elwha River model proposed by Polenz et al. (2004). It would also explain the timing of landform stability and earliest potential occupations of the terrace landforms, critical because it is uncertain if data recovery excavations will recover organic remains suitable for carbon dating. Providing an earliest limiting date for site occupation would aid in any interpretations of technology, subsistence, etc. The depositional history model will be created from data generated by collecting column samples from intact excavation areas of each terrace. Column samples will consist of bulk sediment samples from every 20 centimeters, with at least one sample from each stratum. Individual column samples will be measured for grain size, grain roundness, organic matter content, acidity, and calcium carbonate content. It is estimated that no more than 15 samples will be collected from each column. Grain-size distribution curves and statistics of distributions will be generated. These five variables will assist in discussing parent material, depositional environment, mode of transport, and soil formation of all strata.

An elemental analysis (geochemistry) of all lithostrata is proposed to explain sediment provenance and parent material in order to differentiate between recessional outwash and Elwha River alluvium. The X-ray fluorescence technique will be used to measure 29 major and trace elements. It is estimated no more than three samples will be collected from each terrace, for a total of six samples. Optically-stimulated luminescence dating will be used to date various depositional events and create a site depositional history model. It is estimated two luminescence samples will be collected from each column sample and terrace, for a total of four luminescence samples. Luminescence samples can only be collected from intact stratigraphy, and likely from the C horizon and 2C horizons below the zone of major bioturbation.

2) Is the whole depositional record of the Elwha River-Indian Creek area represented at the sites? Or are the sites missing deposits, or been subjected to erosional events unobserved during the survey and testing?

This question will be addressed by comparing the results from the above question to regional literature, which includes Polenz et al. (2004) and studies referenced therein.

3) What natural and cultural site formation process would have been active during and after occupation? Are these processes similar to those of other Olcott sites?

Reconstructing the vicinity forest community during and after occupation (see proposed paleoecological study) will aid in generating a list of potential agents of disturbances and bioturbation that can modify the archaeological record. Post-depositional alterations to the

archaeological record are known to result from root action, tree throws, burrowing animals, mass wasting, and frost heave (cryoturbation), to name a few. Detailed stratigraphic profiles will be drawn in order to map and measure observable disturbances and estimate the total volume of disturbance. Bioturbation, most notably tree throw disturbances will be mapped, volume calculated, and impacts discussed. Results will be compared to early Holocene archaeological sites with similar site formation processes, which are discussed at length in Chatters et al. (2001) and Blukis Onat (2001).

4) Are vertical artifact locations a function of post-depositional processes like bioturbation, or repeated site visits over time?

Site testing excavations revealed near unimodal artifact distributions that peak in shallow B horizons (Stcherbinine and Noll 2018). It was not possible to discuss the potential of multiple occupations, components, or analytical units due to a lack of test units in artifact-dense areas. The common interpretation is that large unimodal vertical artifact distributions are a result of bioturbation that mix or enlarge what may have been multiple, or one discrete cultural deposit. Low artifact sample sizes across larger site areas that also included disturbances like krotovinas and tree throw casts (or wells) made it unfeasible to measure whether different-sized artifacts were differentially located across a vertical profile, a product of post-depositional bioturbation. It remains unclear if cultural deposits represent single occupations with simple tasks, or repeat visits with diverse task areas altered into an archaeological palimpsest from thousands of years of post-depositional processes.

Several studies have measured microartifact and macroartifact frequencies to analyze the potential of vertical translocation of particles in a sediment column (Evans 2010; Stein and Teltzer 1989). Grain-size distributions of microartifact and macroartifact mirror the sedimentological principal that grain-size distributions are the result of grain-size availability in the source area, mode of transport, and post-depositional disturbance (Stein and Teltzer 1989:4). Creating grain-size distribution curves for artifacts and non-artifacts allows the size distribution of artifacts to be interpreted. Typically, in areas with more bioturbation, artifact distributions would be unimodal with some degree of artifact size sorting as differently weighted/sized artifacts "settle" after being churned with the soil. Chatters et al. (2001) discusses this phenomena by noting the size sorting of larger particles and the creation of "stone zones" on stable landforms that formed during the late Pleistocene.

A micro artifact-macroartifact vertical frequency analysis will answer this question. Artifact-size distribution curves will be created and compared to grain-size distribution curves (from column sampling above) to discuss the degree of artifact movement in extensively disturbed areas compared to areas with relatively few natural disturbances. This will allow further discussion of the nature of the archaeological deposit and weather it is possible to tease out multiple occupations or tasks areas within an archaeological palimpsest.

Site Age

5) What is the age of occupation at the US 101 Elwha River Bridge sites? Were they occupied at the same time?

Recovered projectile points from all three sites suggest an Olcott occupation dating between 10,000 to 6000 BP. It is unknown whether all three sites were inhabited at the same time or were occupied individually. In addition to relative date ranges from projectile points, a suite of absolute dating methods will be considered to provide a more narrow age range of occupation at each site. Dating methods that may be used are: radiometric dating of organic remains, hydration dating of obsidian artifacts, optically-stimulated luminescence of soils, luminescence dating of fire-modified rock, etc. The actual methods used will be determined by the types of sediments as well as the cultural and geologic materials recovered during the data recovery excavations at each site.

Paleoecology

A paleoecological study in the Elwha River-Indian Creek vicinity will answer the research questions listed below. The study will acquire necessary data by extracting at least one sediment core from a lake/pond/wetland in proximity to the sites in the Elwha River Valley. A regional paleoecologist has identified several study sites with great potential within a few miles of the US 101 Elwha River Bridge sites (Dr. Megan Walsh [Central Washington University], personal communication, 2019). Approximately 30 charcoal samples will be extracted from the core, which will allow additional data to be age bracketed. Pollen will be identified and counted to reconstruct changing forest communities and forest density from the late Pleistocene through the Holocene. Elwha River Valley fire history will be reconstructed by counting macro charcoal between age brackets. More detailed methods can be provided if necessary, but will generally align with those used in Walsh et al. (2008; 2017; 2018). Results will be discussed and compared to regional studies (e.g., Gavin et al. 2013; Gavin et al. 2015). Additionally results will be compared to plant remains recovered from regional archaeological sites. Plant communities identified to be in the site vicinity during occupation will be compared to plants known to be used by native peoples ethnographically (e.g., Gunther 1927) and currently near the Elwha River Valley and northern Olympic Peninsula.

6) What plants communities were in the site vicinity during occupation? Which plants in the site vicinity during occupation are known to have been exploited by precontact peoples, exploited during ethnographic times, or currently?

7) During the time of site occupation, were Elwha River Valley forests of the open canopy/parkland variety dominated by Douglas-fir, or closed canopy dominated by hemlock and cedar, which characterizes them today. When did this compositional change take place and how would it have affected plant and animal communities? Is the timing of this change consistent with paleoecological studies of the lowlands in the western and eastern Olympic Peninsula?

8) Were there major fires in the Elwha River Valley during the time of site occupation? How would this have affected plant/animal communities and forest composition?

Paleoecological research indicates postglacial forest composition has changed considerably since the last glacial maximum on the Olympic Peninsula (Gavin et al. 2013; Schalk 1988). The paleoecology of the Olympic Peninsula was recently overviewed by Gavin et al. (2013), which presents a record of changing forest composition and fire over the last 14,000 years. Gavin et al. (2013) overviews five lake study sites in locations ranging from Sitka spruce and hemlock closed canopy lowlands to the open canopy and parkland uplands, with both lowland sites situated in areas quite distinct and removed from the Elwha River Valley and the northern Olympic Peninsula. During the early to middle Holocene (10,000 to 6000 BP), lowland regions of the Olympic Peninsula contained more open canopy forests of Douglas-fir, red alder, and bracken fern, which now contain closed canopy forests containing Western Hemlock Zone species (Gavin et al. 2013). This time range corresponded with a warm-dry climate resulting in longer growing seasons and open forest plants that are more conducive to higher densities of large herbivores (Schalk 1988). Additionally, open forests of Douglas-fir and bracken fern are more prone to drought and fire in warmer months. Recovery from fires is remarkably productive forage habitat for game and people. Open forests possibly recovering from fire would have additionally increased the carrying capacity of ungulate species that included deer and elk, making these forests premier early Holocene habitat for highly mobile precontact occupants subsisting on terrestrial game and plants.

As early as 6000 BP and definitely by 3000 BP, many open forests on the Olympic Peninsula transitioned into closed forests, decreasing the ungulate carrying capacity and plant diversity available for human exploitation (Schalk 1988). As plant resource complexity in the lowlands decreased over time, more effort was required to attain certain resources. There currently is a lack of late Pleistocene and Holocene paleoecological data and fire history for the Elwha River Valley and northern Olympic Peninsula that could explain what plants would have been near the sites during the time of occupation. Additionally, it remains unclear when the open-to-closed forest transition occurred near the sites, which would have caused changes in subsistence strategies of precontact people of the northern Olympic Peninsula.

Settlement and Subsistence Activities

9) What plants or animals were being processed or hunted at the US 101 Elwha River Bridge sites?

To determine what plants and animals were hunted or processed at the sites, the following analyses will be conducted, as appropriate: faunal, macrobotanical, blood residue and FTIR (Fourier Transform Infrared Spectroscopy). Very little faunal remains were observed during the previous investigations and were recovered near the surface suggesting a more recent age. Any faunal remains recovered during the data recovery may be used to determine animals being processed at the sites as well as a source for dateable material. Macrobotanical samples will be collected for analysis within any observed occupation surface and/or cultural feature. A control sample will also be collected to determine whether or not the archaeological sample represents human activity or the natural forest environment. Blood residue analysis will be conducted on a sample of chipped stone tools to determine what animals were being hunted/processed. The results of this analysis will be contingent on the residue preservation within a typical harsh chemical environment of forest soils. FTIR analysis may be conducted if lipids or organic substances have soaked into an organic sediment and/or the surface of a fire-modified rock.

10) Is there evidence for horizontally discrete activity areas and/or functional differences between the US 101 Elwha River Bridge sites?

All three sites have yielded cores, projectile points, other bifaces, flake tools, and unmodified debitage that indicate multiple reduction trajectories were employed in tool-making activities. A robust classification system for both the lithic tools and debitage will enable the identification of patterns of tool production and use that may help distinguish unique activity areas. Attributes such as wear location and type, and breakage patterns will be noted whenever possible. Also, the modification of specimens at various stages in the lithic reduction continuum may be functionally sensitive and thus have a bearing on the development of lithic reduction or use models. Comparison also will be made to samples from the surrounding region.

11) Discovering intrasite variability within each US 101 Elwha River Bridge sites—were different activities and occupations represented and could spatial patterning be identified? If multiple occupations are apparent, what is the approximate time interval between them?

Inferred artifact functions from the artifact assemblage recovered during these investigations are carving, projectile impact, flaking, pounding, and soft scraping. Indicated activities suggest short-duration hunting and processing camping areas of multiple or single occupations similar to other Olcott assemblages in western Washington dating between 6,000 and 10,000 years ago (Blukis Onat et al. 2001; Ferris et al. 2010; Kidd 1964; Morgan 1999a; Samuels 1993). Intrasite patterning will be examined to infer the types of activities being conducted as well as the duration of occupations. This data will be correlated to the site formation and age data to determine an occupation duration at each site.

Trade

12) What was the role of exotic obsidian materials in the Olcott toolkit at the US 101 Elwha River Bridge sites? Is there enough obsidian source data from Olcott sites to model a mobile forager paradigm that could include features of a trade network, opportunistic trade, and/or direct procurement?

Obsidian is noted at several Olcott sites, including 45CA727. Obsidian Cliffs, Oregon, was the source of the obsidian recovered from site 45CA727 (Stcherbinine et al. 2017), the majority of analyzed obsidian from the Tolt site (Blukis Onat et al. 2001), and site 45CA426 at Sequim (Morgan 1999), site 45KI25 at Chester Morse Lake (Samuels 1993), and site 45KI834 near Redmond (Ferris et al. 2010). Obsidian Cliffs is not the only documented source of obsidian in Olcott assemblages; most are located in the northern Great Basin (Blukis Onat et al. 2001; Chatters et al. 2010). Interestingly, an obsidian artifact from the Ilgachuz source in British Columbia was found at site 45CA625, along the Elwha River (Dubeau and Kwarsick 2013), indicating that obsidian procurement is not focused on a single source region. If additional pieces of obsidian are recovered and meet the minimum size requirements, they will be submitted for sourcing analysis.

13) In addition to Watts Point CVR toolstone material, what other sources are represented in the artifact assemblages of the US 101 Elwha River Bridge sites? Were CVR toolstone materials being imported or procured locally?

A small-scale CVR sourcing study following testing at the three Elwha sites found: 1) evidence of CVR procurement from sources other than Watts Point at two of the three sites (45CA727 and 45CA774); 2) a preference of site inhabitants for Watts Point toolstone; 3) a varied selection of rock type for stone tool manufacture; and, 4) no difference between toolstone selected for biface vs. flake tool manufacture (Furlong 2019). Without characterization of the locally available toolstone and other potential sources we cannot determine the geographic origin of sources identified in the study sample other than Watts Point. To fully understand toolstone procurement strategies of site inhabitants, the following work is proposed.

Toolstone sourcing of Olcott-age CVR artifacts through geochemical analysis has a decades long history in Olympic Peninsula archaeological research and is an important aspect of site interpretation. Compilation of data from past sourcing studies allows these sites to be placed into a broader, regional pattern of toolstone procurement strategies from contemporary Olcott-age sites. Using non-destructive portable X-Ray Fluorescence Spectrometry (pXRF) will allow measurement of chemical composition and analysis of important artifacts that would otherwise be exempt from destructive methods.

Building on the previous study, site-specific toolstone procurement strategies will be evaluated on a larger scale. Additional work needs to be done to determine geographic origins of other sources represented in the study sample. A database of CVR sourcing data from previously published work will be compiled, allowing for a more robust evaluation of potential primary and secondary source locations. Additionally, the pXRF calibration created for the initial study will be strengthened by the addition of more controls. Once the CVR database and calibration are complete, geochemical characterization of a larger sample from the three Elwha sites will be completed. Based on time allotted for specific tasks, detailed below, up to 200 samples will be run on the pXRF. These samples can include 50 or more artifacts from each site as well as up to 50 primary or secondary geologic source samples.

Technology

14) Can multiple flake tool types be defined statistically and do those types present a pattern that will help archaeologists refine our interpretation of Olcott site activities, mobility, and tool provisioning?

The three sites in the Elwha River Bridge replacement project APE yielded a total of 39 flake tools during the testing project, comprising 41.5 percent of the tools overall. Flake tools are abundant in many Olcott sites, for example at Tolt (site 45KI464) where 1,116 flake tools were recovered (Blukis Onat et al. 2001). The morphology of flake tools are typically described in terms of metric dimensions, raw materials, and utilization but patterns are often limited to descriptive statistics. The flake tools should reflect activities that were important to daily life and potentially fall into morphological types based on repeated culturally-derived behavior. The recovered assemblage of flake tools will be examined to try and define types that are morphologically similar (divided into

unimarginal and bimarginal tool types) to infer potential activities occurring at each site. Quantitative analysis will focus on the relationships between flake modification attributes and overall tool attributes to distinguish forms that represent deliberate tool forms and/or indicate specific functional needs.

15) How do the US 101 Elwha River Bridge sites fit within the regional Olcott lithic technological landscape?

Research focused on Olcott toolkits has focused on defining the technological organization at each site with an emphasis on description of the artifacts recovered from their respective site (e.g. Butler 1961, 1965; Chatters et al. 2011; Gallison 1994; Kidd 1964; Wessen 1990). The work to define site toolkits has provided insights regarding these individual sites but variation in the approaches to analysis makes intersite comparison challenging if not impossible. As such, a robust comparison of the assemblage from the US 101 Elwha River Bridge sites to other Olcott assemblages throughout the region is limited to very simple observations. The analysis of the lithic materials recovered during the testing phase of the project suggested that unrecognized variability exists within Olcott toolkits (Noll 2019; Stcherbinine and Noll 2018). The problem can be addressed through a reanalysis of the Olcott sites that are at the core of past analytical efforts in conjunction with a robust analysis of the Elwha artifacts to produce a characterization of the variability of Olcott lithic technology that can provide a regional understanding of the technology of that time period. The lithic diversity will become increasingly clear as the sample size increases with excavation at the Elwha Bridge sites and more of the existing curated assemblages are incorporated into the analysis.

Regional Synthesis

16) How do the artifact assemblages from sites 45CA727, 45CA774, and 45CA775 compare to other regional Olcott sites? To other Elwha River sites?

For decades research concerning Olcott tools has focused on describing Olcott tools in detail (cf. Kidd 1964, Wessen 1990). The Olcott projectile point remains the major artifact indicator for these sites, coupled with comments about what these sites do not have (i.e., faunal remains, intact features, other characteristic tools). A cross-comparative study of the assemblages from Olcott sites focused on seemingly non-culturally diagnostic tools may reveal significant Olcott cultural indicators. The artifact assemblages from US 101 Elwha River sites will also be compared to other sites documented along the Elwha River including ones studied during the Elwha and Glines Canyon dam removal projects (Smith and Kopperl 2009).

Field Investigations

Excavation strategy is based on existing site information and changes may be implemented to accommodate information gathered as fieldwork progresses. The following strategy is designed to meet stated project goals and research objectives. All proposed excavation blocks (see attached maps) will be excavated as 1-x-1-m units for horizontal control. Excavation will be in arbitrary 10 cm levels unless cultural or natural stratigraphy allows for stratigraphic excavation within arbitrary levels. Features will be treated as separate stratigraphic units and feature fill excavated

separately. Excavated sediments will be screened through 1/4-in-mesh hardware cloth, with the exception of sediments collected for special analyses or fine-mesh screening. A control unit will selected at each site where stratigraphic column samples will be collected. At the conclusion of the data recovery excavations, AHS archaeologists will work with WSDOT personnel to backfill all excavation blocks with mechanical assistance.

Table 1. Excavation Effort for Each Site within the Elwha US 101 Bridge Replacement APE.

Site Number	Total Area	Area that Will Be Disturbed During Bridge Replacement (% Site Disturbance)	1% Sample (sq m) of Proposed Disturbance	Excavation Block Size(s)
45CA727	7,514 sq m	1,422 sq m (19%)	14 sq m	3-m-x-5-m[1]
45CA774	4,269 sq m	4,269 sq m (70%)	24 sq m	4-m-x-4-m (north of US 101); 2-m-x-3-m E (south of US 101); 1-x-2-m W (south of US 101; near culvert)
45CA775	7,928 sq m	2,370 sq m (30%)	30 sq m	5-m-x-6-m
Deep Testing North of Site 45CA775			4 sq m[2]	2-x-2-m

[1] If all of the units are excavated, the total area will represent 1.05 percent of the proposed disturbance for a total of 15 sq meters for planning purposes; [2]Deep testing will be conducted outside of the boundary of known sites and does not represent a 1 percent sample of planned disturbance in this portion of the APE.

Data Recovery at 45CA727

If WSDOT can avoid/protect these areas during the bridge replacement project and there is no adverse effect to this NRHP-eligible resource, then no further work is warranted at this site. Recovered cultural materials from previous investigations will be used to help answer research questions but no new materials will be collected. If the area cannot be fully protected during the bridge replacement, AHS proposes to excavate approximately 15 square meters of site sediments. Based on the results of previous investigations, the depth of excavation will extend to at least 80 centimeters and will continue until two culturally sterile levels are excavated within each unit. The proposed excavation sample represents 1.05 percent of the total site area that may be impacted during the bridge project. One 3-x-5- m excavation block is planned in an area of high artifact density within the proposed construction access. The actual size and location of the block and units may change based on field conditions including feature excavation.

Data Recovery at 45CA774

A total of 2,370 square meters (30 percent of the total site area) of site 45CA774 will be impacted by cut/fill activities during the bridge replacement project. AHS proposes to excavate approximately 24 square meters (or 1 percent) of sediments where intact high-density cultural deposits will be destroyed by ground-disturbing activities including cut/fill, grubbing, culvert replacement, and construction of access roads. Three blocks are planned for site 45CA774: one 4-x-4-m block north of US 101; one 2-x-3-m block south of US 101 and in the eastern portion of the site; and one 1-x-2-m block south of US 101 and in the western portion of the site (near the culvert). The actual size and location of the block and units may change based on field conditions including feature excavation.

Data Recovery at 45CA775

A total of 4,269 square meters (70 percent of the total site area) of site 45CA775 will be impacted by cut/fill activities during the Elwha US 101 bridge replacement project. AHS proposes to excavate approximately 30 square meters (or 1 percent) of sediments within the site area, which lies entirely within the cut/fill zone planned at site 45CA775. A historic fill stratum ranging in thickness from 28 to 80 centimeters was observed across some portions of the site area. Prior to excavation, the fill stratum will be mechanically removed by a WSDOT-operated excavator. An AHS archaeologist will direct mechanical removal of the fill stratum to ensure the underlying intact sediments are not disturbed. None of the mechanically removed fill will be screened. One 5-x-6- m excavation block is planned in an area of high artifact density within the proposed construction access. Based on the results of previous investigations, the depth of excavation will extend to at least 70 centimeters and will continue until two culturally sterile levels are excavated within each unit. The actual size and location of the block and units may change based on field conditions including feature excavation.

Deep Testing North of Site 45CA775

Previous trenching (Trenches 1-3) from the 2017 investigations resulted in the exposure of buried intact sediments at Trench 1 (which expanded the site boundary of 45CA727) and deep historic fill deposits (230 cmbs in Trench 2 and 150 cmbs in Trench 3). One 2-x-2-m block will be excavated north of site 45CA775 (closest to Trench 3) in an attempt to reach the bottom of the historic fill and to determine if intact sediments with cultural deposits exist below it. Deep testing in this area will provide information regarding the historic use of the site terrace (e.g., leveling an undulating landform for the resort/access road) as well as determine the presence/absence of deeply buried intact cultural deposits. Prior to hand excavation, the historic fill stratum will be mechanically removed by a WSDOT-operated excavator and will be directed by an AHS archaeologist. None of the mechanically removed fill will be screened. To ensure deep sediments can be safely sampled, the excavator may remove more of the surrounding sediments than the planned 2-x-2-m block so that it can be ‘stepped down’. The exposed stratigraphy will be documented in scaled stratigraphic drawings, detailed sediment descriptions, and photographs. All intact sediments will be screened for cultural materials and the removal of all mechanically excavated sediments will be monitored.

Inadvertent Human Remains Discovery

In the event that human remains are discovered, all work in the immediate area will stop. Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. The discovery will be covered from view and the area secured. Human remains will not be left exposed and unprotected. WSDOT and NPS personnel as well as the LEKT, Makah, Port Gamble S’Klallam, and Jamestown S’Klallam tribes will be notified immediately. The project APE is on land managed by NPS and the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 will be followed according to the attached protocol (LEKT 2017). AHS personnel have a long history of respectfully

addressing human remains discoveries and are sensitive to, and knowledgeable of, the cultural and legal concerns relating to the accidental discovery of human remains.

Laboratory Analyses

Following the completion of fieldwork, cultural materials and samples are processed in the AHS laboratory at Eastern Washington University. Artifacts are only minimally cleaned to facilitate the identification of lithic material type and cultural modification but preserve residues that might be present.

Identification slips with provenience and descriptive information are compiled for each formed tool or for groups of unmodified bone, shell, or debitage. Each formed tool is bagged separately with an individual identification slip and assigned a unique catalog number during data entry. Unmodified bone, shell, and debitage are grouped and bagged by general artifact categories for each excavation level and each group is assigned a unique catalog number. Unmodified lithic debitage is grouped by specific raw material type (e.g., all chert debitage for TU 1, Level 1). Diagnostic historic-era artifacts are bagged separately and given individual catalog numbers. Non-diagnostic fragments of historic-era artifacts (e.g., metal fragments) are bagged and cataloged as a group by unit level. Glass fragments are separated into the general categories of flat glass and container glass and by color.

Laboratory personnel identify lithic artifacts according to broad object name categories. Chipped stone artifacts will be grouped based on morphological attributes into either a tool or debitage category following Andrefsky (2005). All battered/pecked/ground stone artifacts will be classified using a technological approach following Adams (2014).

Field and Lab Provisions

General Measurements

Metric units of measure will be employed except for historic materials traditionally expressed in English units. If English units of measure are used, metric equivalents will be noted at least once in the text.

Sampling Strategies

AHS will conduct investigations designed to gather sufficient information to characterize the condition, content, age, structure and function of the archaeological deposits at US 101 Elwha River Bridge sites. Minimum excavation targets are proposed based on test excavation information, as well as a suite of analyses conducive to achieving research objectives. At a minimum, one excavation unit at each site will be sampled for fine mesh screening in order to characterize and quantify cultural materials routinely passing through the 1/4-in-mesh screens. Four liters of sediment will be collected for fine mesh screening from each 10 cm arbitrary level of the selected excavation units.

Referential Control Datum

AHS will establish a grid coordinate system referenced to a known horizontal and vertical control point. Temporary vertical control datums will be established within the excavation area.

Material/Information Recovery Process

AHS will collect all classes of cultural materials and relevant contextual information including portable artifacts, faunal materials, radiocarbon datable materials, pollen, phytolith, macrofloral, and flotation samples. Fire-modified rock will be size graded, lithologically identified, counted, and weighed. All fire-modified rock will be collected.

Occupation Zones

Excavated sediments will be dry screened through 1/4-inch-mesh hardware cloth. Feature sediments will be sampled for flotation and/or fine mesh screening as appropriate. Additional fine mesh screen samples will be collected if warranted. Three-point provenience (x, y, and z coordinate) will be obtained for features and for in situ artifacts in so far as possible or practical.

Features

Features are likely to yield important information and their excavation will be a priority. All excavated features will be sampled as separate stratigraphic and provenience units. Features will be thoroughly documented and sampled. Features will be documented through completion of the standard AHS Feature Form, plan and profile scale drawings, photographs, and content bulk sampling for special analyses including pollen, phytolith, macrofloral, and fine mesh screening.

Features will be exposed in their complete horizontal extent prior to sectioning and the contents documented in situ whenever possible. Feature function analyses will primarily rely on feature content and morphology.

Data Sample and Records Processing

Cultural materials will be handled and processed to maximize the recovery of potential residues. Materials will be cleaned sufficiently to permit cataloging and analysis. Artifact cataloging and labeling will be consistent with the guidelines of the selected artifact repository. All materials are bagged in 4 mil polyethylene resealable bags. Included in the bags are acid free paper printed

labels. After the analysis is complete, recovered materials and samples will be transferred to the National Park Service.

Records

AHS will maintain scientific records on all aspects of the work including but not limited to: field notes; feature records; up to date site map; stratigraphic records; artifacts; and, inventories of radiocarbon, luminescence, macrofloral, pollen, phytolith and other special samples. Photographs will be taken of ongoing work, stratigraphic profiles, features, etc., using a digital camera (24-megapixel resolution).

Materials and Records Studies

As noted above, a variety of materials and features will be analyzed in order to establish site chronology, artifact distribution and integrity, and site function. These objectives will be met through a variety of studies identified below.

Stratigraphy

As a means of assessing soil horizon development and therefore artifact depositional integrity, detailed profile descriptions will be made. The descriptions, along with cultural material distributions, are designed to aid in prehistoric occupation surface definition and natural and cultural stratigraphy.

Chronology

Site use chronology will be established through the use of absolute (e.g., radiocarbon, luminescence) and relative (e.g., historical types, tephrochronology, stratigraphic) dating techniques. Radiocarbon dating may be applied to conventional materials such as charcoal and bone, as well as lesser dated materials and samples such as organic sediment fractions. In addition, occupation chronological information may be obtained through luminescence dating of fire-modified rock. Obsidian hydration analyses will be conducted for potential relative dating of obsidian materials.

Lithic Analysis

Lithic implement and debitage analysis, at a minimum, is divided into three major problem areas: (1) raw material procurement and use through time; (2) reduction and technological system(s); and, (3) functional categories represented in lithic implement categories. Stylistic analysis focusing on the temporal placement of certain artifact forms (e.g., projectile points/knives) is undertaken as possible or appropriate. Both stylistic and technological attributes are examined as

potential indicators of stages of manufacture and/or use. It is anticipated that most analyses will be oriented toward chipped stone samples but may also include ground stone samples, if available for study.

Debitage Analysis

Flakes are defined as having sharp edges and at least one additional flake attribute (e.g., a bulb of force, compression rings, hackles, or a platform). Recognizably modified pieces of debitage are cataloged individually and not included in debitage analyses. After sorting by material type for cataloging, lithic debitage is analyzed by size and lithic reduction stage. Five arbitrary size categories are defined: less than 6 millimeters, 6 to 13 millimeters, 13 to 25 millimeters, 25 to 50 millimeters, and greater than 50 millimeters. Debitage will be sorted into four categories based on the presence of distinct flake attributes: proximal flakes with cortex, proximal flakes without cortex, flake shatter, and angular shatter following Andrefsky (2005). Proximal flakes include all debitage with a striking platform, and single dorsal and ventral surface. Proximal flakes are subdivided into flakes with cortex and those without cortex. Flake shatter includes flake fragments that lack the platform but have a single recognizable dorsal and ventral side. Angular shatter are pieces of lithic raw material that may exhibit a single flake attribute but do not fit any of the other flake categories. Shatter typically is associated with other debitage and is comprised of high quality raw material. The platforms of proximal flakes will be cataloged using five platform varieties: cortical, flat, simple (single arris), complex (2 or more arrises with the same orientation), bifacial (2 or more arises divided across the platform width). This classification system will allow for a single catalog of debitage that may represent more than one reduction trajectory.

Projectile Point Classification and Analysis

All tools will be analyzed using presence/absence of morphological attributes and calculated measurement indices that characterize shape. The degree of type standardization will be evaluated using 3-dimensional (3D) laser scanning and analysis for tools that represent stylistically designed forms. Projectile points are the most likely candidates for this analysis but other suspected of being designed to a morphological standard will be included in the 3D analysis. The technological analysis will utilize the results of raw material analysis conducted as a separate line of research.

Fire-Modified Rock Analysis

Fire-modified rock will be analyzed noting a variety of criteria including: size; weight; lithology; fracture morphology (e.g. parallel or normal to gravel surface) indicative of expansion (compression) or contraction (tensile) forces; and, vertical and horizontal distribution. Contingent on the context, samples of fire-modified rock may be collected in the field for luminescence and/or FTIR analysis.

Faunal and Macrofloral Studies

Faunal and macrofloral studies focus on the identification of animal and plant resources (respectively) used by prehistoric site occupants. Taxonomic identification and the role of specific animals and plants in the subsistence pattern(s) of prehistoric people constitute the principal focus of this aspect of the proposed research. Faunal analyses are likely to be limited due to poor bone

preservation. In an attempt to extract faunal and macrofloral economic information from the site, AHS will sample feature fill or other cultural deposits for flotation and fine mesh screening. Charcoal-rich feature fill sediments hold the highest potential for meaningful flotation analysis as they are most likely to contain charred macrofloral and faunal remains.

Pollen and Phytolith Studies

In addition, samples for pollen and phytolith analysis will be collected to better characterize their preservation and research potential for understanding prehistoric site use, subsistence activities, and paleoenvironment. Paired pollen and phytolith samples will be collected from both stratigraphic column and from special sample areas, particularly cultural features. Unanalyzed samples will be retained for future study.

Residue Studies

Stone artifacts will be processed with the assumption that protein or other residues (e.g., lipids and phytoliths) are preserved on them. In consultation with the WSDOT, a sample of these implements may be submitted for residue identification.

Comparative Study

AHS will use relevant extant archaeological information for comparative analytical purposes in interpreting the records at sites 45CA727, 45CA774, and 45CA775. Published sources containing relevant environmental and cultural information will be consulted and used as appropriate.

Data Entry

Artifact provenience and descriptive information are entered into a database program (FileMaker Pro 15) using a template created for AHS field catalogs. Unique catalog numbers (1, 2, 3, etc.) are assigned to each artifact or group of artifacts (as defined above) as data records are created. Artifact information is entered by provenience then by object class and catalog numbers are assigned sequentially. This computer database is used to print reference catalogs and clean, acid-free paper identification slips to be curated with the artifacts.

Labeling and Packaging

Each cataloged artifact (or groups of artifacts) is placed in a resealable polyethylene bag with an identification/provenience slip printed on acid-free paper. Feature sediment and charcoal samples are prepared for analysis or curation. Samples are allowed to dry and are repackaged in clean foil pouches (charcoal) or plastic bags (sediment) labeled with pertinent provenience information.

Reports

AHS reports are prepared following the style guidelines of the Society for American Archaeology and the Chicago Manual of Style, 17th revised edition. Efforts are made to prepare clear concise reports using a synoptic approach. Active phrasing is used whenever possible and lengthy technical descriptive information will be presented in appendices in tabular formats.

The reports will be prepared in Times New Roman 12 point typeface. Three paper and digital copies of the draft report will be submitted for review and comment and 10 paper and digital copies of the final report will be provided.

The draft reports will be in as nearly complete form as possible (including maps, drawings and photos) and should only require minor editing. AHS will address comments on the draft when preparing the final report.

References Cited

Adams, Jenny
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Appendix

Inadvertent Discovery Procedures/Discovery of Human Remains Protocols
Lower Elwha Klallam Tribe

DISCOVERY OF HUMAN REMAINS

If any activity exposes anything that appears to be human remains, either burials or isolated teeth or bones, or other mortuary items, the find will halt immediately in an area sufficient to maintain integrity of the deposit and the following protocol shall be used:

1) All persons shall immediately halt ground-disturbing activities around the discovery and it shall be secured with a perimeter of not less than thirty (30) feet in the Area of Discovery).

2) The Supervising Professional Archaeologist meeting Secretary of Interior professional standards will immediately notify the Project Supervisor.

3) Upon receiving notice, the project supervisor shall immediately notify the Lower Elwha Klallam Tribal Police, the Port Angeles City Police and request that the state physical anthropologist of the Department of Archaeology and Historic Preservation (DAHP) be notified of the discovery. The Clallam County Coroner will then determine if the remains are forensic or non-forensic and if the site is a crime scene.

4) Contemporaneous with notifying law enforcement and the Coroner, the Project Supervisor shall also notify the DAHP and the Lower Elwha Klallam Tribe (LEKT) Tribal Chairperson of the discovery.

5) The project supervisor and the Supervising Professional Archaeologist will work with the responsible law enforcement designee, and the Coroner to request that they handle the remains and disturb the site only to the extent needed to determine if the remains are Native American and if the setting is a crime scene.

6) If the human remains are determined by the Coroner to be Native American, then the Project Supervisor shall consult with the Lower Elwha Klallam Tribe (LEKT) and the DAHP physical anthropologist to determine treatment and disposition. If the human remains are determined by the Coroner to be Native American, then the Project Supervisor shall consult with the Lower Elwha Klallam Tribe (LEKT) and the DAHP to determine treatment and disposition. The project supervisor shall secure and buffer the area of the find with fencing, barricades, or by other restrictive means to ensure protection of the find during the process of notification or for additional archaeological recording and/or recovery. The remains shall be covered with either tarps or geotextile material to prevent unauthorized photography of the remains.

7) If the human remains are determined by the Coroner not to be Native American, and the Lower Elwha Klallam Tribe (LEKT) does not reasonably object to that determination, then neither the Project Supervisor nor the LEKT shall have any further obligation to one another for the handling of such remains under this procedure.

8) If human remains, funerary objects, ceremonial objects, or artifacts are inadvertently collected during any archaeological investigation on behalf of the Project Proponent and identified as Native American in the field or in the laboratory, the Project Proponent in consultation with DAHP and LEKT, will notify and return the remains, objects or artifacts to the LEKT within twenty-four (24) hours of the identification, or if that is not practical, then at a time acceptable to the LEKT. All human remains, funerary objects or artifacts shall remain unwashed and without further analysis, and shall remain onsite with 24-hour security or at a secured off site repository.

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Appendix B — Archaeological Predictive Model Map