Federal Highway Administration and National Park Service

Finding of No Significant Impact

US 101 Elwha River Bridge Replacement

November 17, 2021

The Federal Highway Administration (FHWA) and the National Park Service (NPS) have determined that the **US 101 Elwha River Bridge Replacement** project will have no significant impact on the human environment. This finding of no significant impact (FONSI) is based on the US 101 Elwha River Bridge Environmental Assessment (EA). The EA was prepared in compliance with the National Environmental Policy Act of 1969, as amended, and 23 CFR 771. The EA has been determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required.

This FONSI documents the decision of the NPS to adopt the preferred alternative in the US 101 Elwha River Bridge Replacement EA. The proposed action alternative includes 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 to correct a curve with substandard geometrics and sight distance. WSDOT will build a new bridge on a new alignment just north of the existing bridge. The existing bridge will remain open to traffic during construction, assuming the current bridge remains structurally sound. Once construction is completed, traffic will be shifted onto the new bridge and the old bridge will be removed. Construction is expected to take 2 years to complete. The alternatives were described and analyzed in the US 101 Elwha River Bridge Replacement EA.

The Superintendent's determination of no impairment, prepared in fulfillment of the NPS *Management Policy 2006* requirements, is also attached.

Alternatives Analyzed

The following alternatives were considered in the EA for the WSDOT US 101 Elwha River Bridge Replacement project:

- No Action: "No Build Alternative" - the project activities will not be implemented.
- Proposed Action Alternative: "Build Alternative" - 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 to correct a curve with substandard geometrics and sight distance.

Description

The Build Alternative was chosen after a process that evaluated engineering feasibility of several alternatives. Alternatives considered but not selected are each briefly described in Section 2.3 of the EA. 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 will build a new bridge on a new alignment just north of the existing bridge. The existing bridge will remain open to traffic during construction, assuming the current bridge remains structurally sound. Once construction is completed, traffic will be shifted onto the new bridge and the old bridge will be removed. Construction is expected to take 2 years to complete.

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 will be a fixed-span concrete girder bridge founded on large diameter, cast-in-place concrete drilled shafts. The new bridge will 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 in the EA).

The bridge substructure will 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 will be founded in bedrock and extend above the 100-year flood elevation. The bridge height over the normal high-water elevation will 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 will 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 will 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, will 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 will be restored and the trailers will be disconnected from any utilities and removed.

Construction Staging and Access

Establishing access to the new bridge pier locations in the river channel will be the first element of work. Access will be gained by constructing temporary access pads in the riverbed. These access pads will 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 will begin. Each bridge pier will be composed of two large diameter drilled shafts. After the shaft excavation is completed, reinforcing steel and cast-in-place concrete will complete each pier foundation. Concrete bridge support columns will be constructed at Piers 2 and 3. Abutment Piers 1 and 4 will have cast-in-place concrete retaining walls around the north, south, and waterward sides of the shafts to complete the abutments. The bridge superstructure will 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 will support a cast-in-place bridge deck.

Roadway Construction
The project will 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 will include a new intersection with Olympic Hot Springs Road beginning about 400 feet east of its current location. Roadway construction will 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 will be demolished. Demolition will need to occur from above and below the bridge out into the Elwha River because of the configuration of the existing bridge. Overwater demolition will 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 will provide for equipment access and a surface to drop and contain concrete debris for subsequent removal.

For each demolition phase, a cofferdam, buttressed with riverbed material, will 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 will 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 will be constructed behind the isolation dam, and demolition of the old bridge superstructure and foundations will begin. Fish removal will be done according to WSDOT Fish Exclusion Protocols and Standards (WSDOT 2017c). The process will be repeated for the remaining bridge portion. The demolition pad, isolation dam, and the construction access pad will be removed from the river following the bridge demolition and the river channel will be restored.

Roadway Demolition
The roadway approach sections on either side of the existing bridge abandoned by new highway alignment will be demolished. This work will likely consist of impact-breaking the roadway surface, then removing the asphalt and subgrade with heavy earth-moving machinery. Demolished roadway material will 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 will be revegetated with species similar to those removed. Restoration of disturbed areas will generally follow the standards contained in WSDOT's Standard Specifications (WSDOT 2021) for roadside restoration and WSDOT's Roadside Policy Manual (WSDOT 2015). This will 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 will result in an increase of impervious surface from 2.9 acres (existing) to 3.3 acres. WSDOT will 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.

Other Alternatives Evaluated

Chapter 2, Section 2.3, pages 10-12, of the EA describes the alternatives considered but dismissed.

Why the Selected Alternative Will Not Have a Significant Effect

After considering the environmental consequences described in the EA, the FHWA and NPS have determined that the Selected Alternative and its associated actions will not have a significant effect on the quality of the human environment. Thus, an Environmental Impact Statement (EIS) will not be prepared. This finding is based on the following:

- The Selected Alternative will not result in significant effects on the unique natural resource characteristics of the area, including prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The Selected Alternative will have an adverse effect on cultural resources. A Memorandum of Agreement (MOA) has been developed with the SHPO, ACHP, and the LEKT detailing the mitigation for adverse effects on cultural resources (See Appendices G and E for the MOA and a record of tribal correspondence).
- The Selected Alternative will have the following effects on species listed or proposed for listing as endangered or threatened or their critical habitat as determined under the Endangered Species Act of 1973 through consultation with the US Fish and Wildlife Service and National Marine Fisheries Services.
    - ***no effect*** on northern spotted owls (*Strix occidentalis caurina*);

    - ***may affect, is not likely to adversely affect*** marbled murrelets (*Brachyramphus marmoratus*);
    - ***may affect, is likely to adversely affect*** Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*);
    - ***not likely to adversely affect*** eulachon (*Thaleichthys pacificus*);
    - ***may affect, is likely to adversely affect*** steelhead and bull trout critical habitat; and
    - ***no effect*** on Chinook salmon or eulachon critical habitat.
- The Selected Alternative has a wide range of beneficial and adverse effects (see Measures to Minimize Environmental Harm below).
- The Selected Alternative will not adversely affect public health or safety.
- The Selected Alternative will not violate federal, state, or local laws or requirements for the protection of the environment.

Environmental Commitments

The environmental commitments described below have been identified as the practicable means to avoid and minimize effects from the Project. FHWA and WSDOT are responsible for implementation and compliance with all environmental commitments.

Resource	Environmental 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 appropriate best management practices. Potential for erosion during construction operations will be reduced by following the BMPs 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 will be restored with native trees and shrubs. Some portions of the vacated US 101 roadway will similarly be restored except where they are incorporated into project elements such as the realigned turnoff for the Olympic Hot Springs Road or stormwater treatment facilities. A total of 5.14 acres of project area are designated for restoration with native vegetation as part of the Build Alternative.
Surface Water	Water quality effects will be limited by the use of Best Management Practices (BMPs) which will be outlined in the contract specifications for the project. The project will maintain compliance with state water regulations in WAC 173-201A. Before project completion, WSDOT will install water quality treatment facilities along new roadway segments and construct conveyance

	structures to carry stormwater to planned treatment areas and discharge points.
Fish, Wildlife, and Threatened and Endangered Species	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, BMPs to reduce the risk of delivering sediment to waterbodies, BMPs to reduce the risk of introducing pollutants to waterbodies, and BMPs for in-channel construction (e.g. restricting work to approved "in-water work windows"). Project activities will fully comply with the Hydraulic Project Approvals (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, or 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 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 conducted 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 will be undertaken to determine the number and size of trees the project will remove. When trees are removed for a project, WSDOT will 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, will 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 will be treated with a weathering agent consistent with 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 travel delays 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.

Public Involvement

The EA was posted on the Project website and the WSDOT Engage webpage for review and comment, and a press release was sent out to local and regional media outlets. Notification of the open comment period appeared in the Forks Forum, the Peninsula Daily News, WSDOT's Facebook and Twitter accounts, and the project website. The public comment period was open from July 19 through August 18, 2021. Thirty-two pieces of correspondence were received from twenty individual commentors. Due to restrictions on in-person meetings due to the pandemic, no in person public meetings were held during the comment period. WSDOT held an online open house where the public could learn about Project details and provide comments on the EA. A voicemailbox was set up to provide the public another way to provide comment, request project information or copies of the project documentation. WSDOT and FHWA held six in-person public meetings between 2016 and 2019 in Port Angeles and Forks. Officials presented to two Port Angeles City Council meetings, one Forks City Council meeting, one West End Business Association Meeting in Forks, and to two other stakeholder groups in Port Angeles and Forks.

Comments and responses are in Attachment A.

Agency and Tribal Consultation

Several agencies, and the Lower Elwha Klallam Tribe, have provided technical support addressing a variety of issues and impacts associated with this project. These agencies include the NPS, FHWA, Washington Department of Archaeology and Historic Preservation (DAHP), US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and US Army Corps of Engineers (USACE). The following outreach and coordination actions have been completed or are underway:

Washington Department of Archaeology and Historic Preservation

Coordination with the Washington Department of Archaeology and Historic Preservation began in 2017, concluding with a MOA signed in April 2021.

Lower Elwha Klallam Tribe

The NPS, FHWA, and WSDOT consulted with the Lower Elwha Klallam Tribe during the development of the US 101 Elwha River Bridge Replacement EA. Mitigation measures to address adverse effects from the project are documented in a MOA (Appendix G of the EA).

U.S. Fish and Wildlife Service and National Marine Fisheries Service

Endangered Species Act Section 7 Consultation began in September 2017, with the submittal of a Biological Assessment to the USFWS and NMFS. Concurrence on the effects determinations was received from the USFWS on March 19, 2018, and from the NMFS on March 2, 2018. FHWA and WSDOT are in the process of re-initiating consultation with the Services for the in-water mitigation.

U.S. Army Corps of Engineers

A Joint Aquatic Resources Permit Application (JARPA) was prepared and has been submitted to the USACE. Pre-filing notifications for Section 401 Water Quality Certification were submitted and the Washington State Department of Ecology (Ecology) on December 28, 2018. The permit applications are currently being revised to reflect planned in-water mitigation and will be received prior to the project going to construction.

Finding

The FHWA and NPS have determined that the **US 101 Elwha River Bridge Replacement** project will have no significant impact on the human environment. This FONSI is based on the attached Environmental Assessment (EA) which has been independently evaluated by the FHWA and NPS and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required.

On the basis of the information contained in the EA as summarized above, the NPS and FHWA, have determined that implementing the Proposed Action Alternative is not a major federal action nor is it an action without precedent or similar to an action that normally requires an EIS. The conclusions of non-significance are supported by the conservation planning and environmental impact analysis completed and the capability of listed mitigation measures to reduce or eliminate impacts. There will be no adverse effect to cultural or historical resources; and there are no significant impacts. This determination also included due consideration of all agency and public comments. Therefore, in compliance with the National Environmental Policy Act, an EIS will not be prepared, and the selected project may be implemented immediately.

Recommended:

Digitally signed by MARY CREACHBAUM
Date: 2021.11.19 15:54:58 -08'00'

Sarah Creachbaum — Date
Superintendent
Olympic National Park

Approved:

CINDY ORLANDO Digitally signed by CINDY ORLANDO
Date: 2021.11.22 13:45:25 -08'00'

11/22/21

Cindy Orlando — Date
Acting Regional Director
Interior Regions 8, 9, 10, and 12

Digitally signed by MELINDA MICHELLE ROBERSON
Date: 2021.11.18 15:43:23 -08'00'

11/18/2021

Melinda Roberson — Date
Acting Division Administrator
Federal Highway Administration – Washington Division

Attachment A. Comments with Responses

Attachment B. Errata to the Environmental Assessment

Attachment C. Notice of Adoption of EA under SEPA

Attachment D. FONSI Distribution List

Attachment E. Final Section 4(f) Individual Evaluation

Attachment F. Determination of Non-Impairment

Appendix A - Comment Response

Comment index

Comment ID	Name	Organization	Form	Date Received
Comment 1	Ted Allison	WA Department of Natural Resources	Online Form	7/20/2021
Comment 2	Joseph DeBlois	Private individual	Online Form	7/20/2021
Comment 3	Stacey Mishler	Private individual	Online Form	7/20/2021
Comment 4	Brian Hays	Private individual	Online Form	7/21/2021
Comment 5	Joerg Zuend	Private individual	Online Form	7/21/2021
Comment 6	Cathy Steiger	Private individual	Online Form	7/21/2021
Comment 7	Mitchell Wilson	Private individual	Online Form	7/21/2021
Comment 8	Daniel Anyikaeme	Private individual	Online Form	7/22/2021
Comment 9	Sean Coleman	Private individual	Online Form	7/22/2021
Comment 10	Sean Coleman	Private individual	Online Form	7/22/2021
Comment 11	Jenna Marie Chaffeur	Private individual	Online Form	7/22/2021
Comment 12	Peter Walchenbach	Private individual	Online Form	7/24/2021
Comment 13	Lucille Celestino	Private individual	Online Form	7/25/2021
Comment 14	Dianne Holterman	Private individual	Online Form	7/30/2021
Comment 15	Glenn Wiggins	Private individual	Online Form	8/2/2021
Comment 16	James F. McEntire	Port Angeles Business Association	Online Form	8/2/2021
Comment 17	Joe Wright	Private individual	Online Form	8/4/2021
Comment 18	Katie Haag	Private individual	Online Form	8/16/2021
Comment 19	Ed Bowen	Private individual	Online Form	8/18/2021

Comment ID	Name	Organization	Form	Date Received
Comment 20	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 21	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 22	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 23	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 24	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 25	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 26	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 27	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 28	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 29	Ed Bowen	Private individual	Online Form	8/18/2021
Comment 30	Ed Bowen	Private individual	Voicemail	8/18/2021
Comment 31	Edwin Johnson	Private individual	Letter	8/13/2021
Comment 32	Rebecca Paradis	Clallam County	Letter and Online Form	8/6/2021

Comment Response

Comment 1

I have a comment for this project EA:

The Environmental Assessment mentions 461 trees within the clearing limits of the project that will need to be removed. It may be necessary to apply for and obtain a Class IV General Conversion Forest Practice Application from WA DNR. This is if the project is on land under WA DNR Jurisdiction (private or state forest land) and the trees that are harvested are sold.

Contact WA DNR Olympic Region Forest Practices at 360-374-2800 for questions about the forest practice application process.

Thanks for the opportunity to comment,

Response 1

Tree removal will occur on Olympic National Park project lands or existing WSDOT right of way and therefore no land will be converted from a forestry use. WSDOT contractors will assess the final clearing and grading limits and apply for Forest Practice permitting as applicable. Harvested timber is planned to be retained on site and incorporated into the project.

Comment 2

Timeline looks good Bridge looks good. Did you think about a personal walkway and possible boat launch.

Response 2

Recreational access was evaluated as part of this project and the expansion of facilities was determined not to be feasible. The project is located on "Elwha Project Lands" which are lands designed by Congress in the "Elwha Act" for interim management by the National Park Service, Olympic National Park, due to the removal of the Elwha and Glines Canyon Dams for the Elwha River Ecosystem Restoration Project. These lands are temporarily managed by Olympic National Park until turned over to a permanent owner. These lands are not designated for recreational use and the park does not currently have plans to construct additional facilities at this time. The informal parking and river access will be maintained, but not expanded.

Comment 3

I like the plan, especially the more gentle corner. The bridge definitely needs to be replaced. No need to contact me.

Response 3

Thank you for your comment.

Comment 4

Looks good-get started!
We live to the west of the bridge. We know there will be some inconvenience, but that bridge needs replacement.

Response 4

Thank you for your comment.

Comment 5 - 1

Thanks for the project description. Three comments:

1) The rerouting of the Olympic Hotsprings Road due to flooding underwent an environmental impact assessment. A proposal was made to start construction of a studied alternative in 2020. There seems to be a dispute with the Klallam tribe on the chosen alternative with no resolution in sight. In fact I have information that a written request by the Klallam tribe has not even resulted in a close discussion between planning team and tribe. I take no position on the merits of arguments by the tribe and the planning team. I take issue with the fact that two parties remain in a non-speaking position after such long planning.

You mention that there is a memorandum of understanding between the WSDOT and the tribe. Does this mean that the tribe has accepted the alternative? If so, is it binding? What is done to prevent delays such as occur with the Olympic Hotsprings road and foster Mutual, and cordial relationships with the Klallam tribe?

Response 5 – 1

The Olympic Hot Springs Road project is an Olympic National Park project and separate from the Elwha River Bridge Replacement project. WSDOT and FHWA have been in close coordination with the Lower Elwha Klallam Tribe in developing the Elwha River Bridge Replacement Project. Close coordination and participation with the Tribe has ensured Tribal interests have been incorporated and will continue as the project moves forward. There is a MOA between WSDOT and the Lower Klallam Elwha Tribe for the Elwha River Bridge Replacement Project and we will continue coordination and consultation with them throughout the project.

Comment 5 - 2

2) Engineered logjams: Here on the peninsula we have an “opinion influencer” - Pat O'Neill - commenting frequently on our newspaper the Peninsula Daily News. Just in today’s edition he did an opinion piece against engineered logjams in the Hoh River at MP 174. He states it is detrimental to the Salmon run. I take no position nor do I understand the details of engineered logjams. But given that there seems some controversy, what is being done to properly design these logjams?

Response 5 – 2

The WSDOT has retained the services of an industry leader, Natural Systems Design, to configure and design the Engineered Log Jams. The design includes hydraulic modeling, carefully estimated runoff values, and understanding of the fluvial geomorphology of the Elwha system, with one of the world's foremost experts in engineered log jams involved in the design. The structures will provide enhanced habitat for salmon to directly compensate for project impacts and contribute towards restoration of this severely degraded river system.

Comment 5 - 3

3) Last, if the two concerns above are valid - which indeed is a concerted activation of stakeholders that will endlessly delay the project, has consideration been given to a single span, possibly suspension bridge, that would require no work within the current bed of the river? I take no position in the appropriate engineering but suggest that the maximum is being done to confront opposition upfront.

Please contact me for discussion.

Joerg Zuend

Port Angeles

Response 5 – 3

In December of 2018 analysis and consideration of seven bridge pier configurations, one of which being a single structural steel span bridge with no piers within the river, was conducted. Construction costs for the single span bridge were estimated to be approximately $11M greater than the selected 3-span prestressed concrete girder option, with additional major drawbacks being the high initial cost, frequency, and sustainability of maintaining the steel elements, and potential detrimental aesthetics of a huge steel through span structure.

Comment 6

Acceleration lane does not appear long enough on east end for those exiting the park or heavy loads going up the hill.

Response 6

The acceleration lane was evaluated, and the current design meets all applicable highway design criteria.

Comment 7

I have looked over the plans for the bridge and feel that there is a better location for the bridge and the highway leading and going from the bridge. I feel the bridge will now face further erosion issues whereas the new location that I am suggesting will not.

If built-in the location that I am suggesting, we can avoid impacts on those who use the existing bridge because it would not have to be closed while the new bridge and roadway are being constructed.

Response 7

WSDOT worked with expert river hydraulic engineers to conduct extensive hydraulic modeling of the river dynamics and pier placement for the project. The proposed design demonstrates a sustainable bridge that meets current seismic standards.

The bridge will be constructed "offline", and US 101 will function as normal during construction except for a planned 9-day closure needed to construct the Olympic Hot Springs intersection and mainline tie-ins to US 101. The detour will reroute US 101 traffic to SR 112, and local Olympic Hot Springs traffic on to Little River Road during the 9-day closure.

Comment 8

In all that is done please ensure its in line with that precision given and align to its initial intent of purpose and make your is on the right timing

Response 8

Thank you for your comment.

Comment 9

Is both the Elwha Bridge and Indian Creek Bridge Construction going to happen at the same time? If so, bad timing.

Response 9

Yes. Both projects are expected to be in construction in 2022 and 2023. Minus the 9-day closure needed to construct the Olympic Hot Springs intersection and mainline tie-ins, US 101 will function as normal with no anticipated construction closures. Crews will build the new US 101 Elwha River Bridge offline, while travelers use the existing crossing during construction. This work will have little to no effect on the construction further west at Indian Creek, where a temporary bypass will be in place to keep people moving.

Comment 10

What are the DBE goals on this project going to be and how much extra cost is that going to add to the project total?

Response 10

The US 101 Elwha River Bridge replacement project includes federal funds. As such, DBE Goals are mandated costs, not optional ones. Final DBE goal costs will be published once the project is successfully advertised and awarded.

Comment 11

Hello,

I am a frequent traveler between Port Angeles and Forks and I am also a geologist. I'm curious what the seismic standards are that the bridge has to be built under? Is this only including the cascadia subduction zone earthquake or does the seismic hazard also include risk from a earthquake on the lake Creek boundary Creek fault?

Response 11

Seismic geotechnical/geological design of bridges is governed by the standards below:

• WSDOT, 2020. Geotechnical Design Manual M46-03.09, Olympia, WA, USA.

• AASHTO. 2020. LRFD Bridge Design Specifications, 9th Ed., American Association of State Highway and Transportation Officials (AASHTO), Washington DC

• AASHTO, 2009, AASHTO Guide Specifications for LRFD Seismic Bridge Design, American Association of State Highway and Transportation Officials, First Edition, Washington D.C.

Seismic design of bridges probabilistically considers all source zones, including the Cascadia subduction zone and crustal earthquake sources. This is accomplished through data gathered and analyzed by USGS. For more detailed information about earthquake sources used for seismic bridge design, please the WSDOT Geotechnical Design Manual, specifically, Chapter 6 and Appendix 6-A.

Comment 12

As a daily driver across the bridge my current and future concern is the eastern approach to the bridge heading in both directions. I want to know and see more detail about what the approach will look like, including details on the Hot Springs Road interchange with US101. Your graphics of the proposed new bridge appear to show a very tight curve approaching the eastern side of the bridge when heading west. How does traffic mitigate confused tourists in large RV's slowing and stopping at the interchange and new viewing parking lot as log trucks and traffic descend the steep winding grade above the eastern approach.

Response 12

Thank you for your question. The new US 101/Olympic Hot Springs Road lane configuration will be a much gentler eastern curve approaching the new bridge. More detailed descriptions of this illustration are located on Figure 2, page 5 of the Environmental Assessment. Proposed lane widths, taper lengths, and acceleration lane design all meet current design standards. The parking lot is a continuation of the existing lot, and accessible from Olympic Hot Springs Road rather than directly from US 101.

Comment 13

I support the efforts to replace the bridge and the approach to it.

Response 13

Thank you for your comment.

Comment 14

I have traveled over the bridge at the Elwha River regularly for the last 30 years. It is a beautiful area, and it is beautiful to be able to see the river there. I really don't see what is environmentally hazardous about the bridge that's already there. It seems like disturbing the land and building a new bridge would be more environmentally damaging. However, if the powers that be decide to build a new bridge for some reason, I would hope that they build one that is aesthetically pleasing and does not block the view of the natural surroundings of the river. Or to put it another way, I hope they don't build an ugly bridge that blocks the views of the river. Since it does seem like disturbing the land in that area would be more of an environmental hazard for the river, the only reason I can think of someone wanting to replace it is to create jobs. I think there are other ways to create jobs. Please don't destroy the natural beauty of the scenery in the area by the Elwha River on US 101. It is a treasure.

Response 14

The existing Elwha River bridge was built in 1926. In conjunction with the Elwha River Restoration Project which removed two dams, the Elwha River has dramatically eroded the riverbed as it restores to a natural river system. This led to significant erosion at the bridge foundations by as much as 14 feet and undermined the structural integrity of the bridge leading to the need for bridge replacement. Visual quality was considered and evaluated for this project. Construction of the new bridge will result in temporary impacts to vegetation, but all impacted areas will be restored and revegetated. The bridge design itself will be similar to the existing bridge in that it will be 'flush' with the road and not stand out. Please see section 3.4.14 of EA for the detailed discussion of visual quality.

Comment 15

Regarding the planned construction of a new Elwha bridge, I have reviewed our exhaustive file that defines the issues we had raised and make a thorough estimate of the cost of an alternate location without building a new bridge.

Snow melts that we have not seen in years could awaken this river laden with large woody debris and the new structure could be seriously damaged or destroyed. The alternate we have suggested is largely immune to such a scenario. The current direction without a Value Engineering Study is like needing insurance after you need it. In spite of that, I suspect the new bridge will be built since an unbiased study of the alternate has not been funded and has been denied. At the very least, the location and development of preliminary plans for an alternate route in the event of catastrophe should be prepared.

Response 15

In December 2016, WSDOT evaluated seven alternative routes for this project. Cost estimates of these evaluations ranged from $600k to $50M. The lowest cost proposal of $600k was a "no-build and remove the bridge" option - something WSDOT has determined is not in the public interest. The remaining options ranged from improving State Route 112, improving existing road conditions, and construction of a new bridge on a new alignment across the river. Final analysis favors a new bridge on a new alignment with respect to costs, environmental impacts, consideration of river dynamics and sustainability.

Comment 16

Expedite the US 101 Elwha Bridge Replacement.

We don’t need to explain in detail how collapse or stringent weight limits on a damaged bridge hurts the Clallam County economy, especially on the west end of the County.

Funding is already provided in the State transportation budget. Expediting construction through legislative action cements the existing funding and removes a dangerous hazard to the North Olympic Peninsula’s economy. Especially since SR 112 is prone to closure due to landslides, like it was for seven months this year.

This project has a dramatic impact to Port Angeles, the Clallam County's West End, and in limiting access to the National Park.

Jim McEntire

Chair, Government Affairs Committee

Port Angeles Business Association

Response 16

WSDOT continues working diligently toward construction of the new bridge in cooperation with other state and federal agencies and tribal governments. agencies.

Thank you for your support.

Comment 17

I find it hard to believe that WSDOT is still dragging it's feet on this project. You stated that the bridge is past it's operational age and is a danger. Other than the construction period you cannot be impacting the environment more than the current bridge. And the bridge is the only safe and viable connection with the West side of the peninsula. Waiting until there is catastrophic failure of the bridge and further accidents associated with the current bridge is truly foolish. Get to work on the new bridge which is obviously the least expensive alternative and safest alternative available.

Response 17

WSDOT continues working diligently toward construction of the new bridge in cooperation with other state and federal agencies and tribal governments.

Comment 18

Build the Elwha 101 bridge. It is a vital link to the Olympic Peninsula. As shown by the long term closure and patch job of the highway 112 of the 8 mile series of slides closure the highway 112 is not a dependable or safe passage. It also increases travel time for Forks area residents.

Cultural artifact preservation/conservation can be coordinated with the Elwha tribe. Balance can be struck with improved public access/lighting/parking with conservation of natural and cultural preservation. The aesthetics of the current bridge design is appealing and safe. One less bridge support in the river is beneficial to all concerned parties.

It is in the interest of all local communities to build the bridge. Money has been invested in the various phases of research and planning of the replacement bridge. Let's not hold up the replacement of the vital Elwha highway 101 bridge. Residents and visitors need safe, efficient passage by this route.

Response 18

Thank you for your comment.

Comment 19 -1

This online form does not clarify if I am provided a copy of what I write; how do I know what I write and submit for the record. This online open house is the farthest from the truth and questions cannot be asked and responded to in a timely and productive manner. Today is the deadline, why is there a deadline when the NEPA parties in government aren't required to meet a deadline? That is my question.

Response 19-1

We are sorry the WSDOT Engage public involvement tool was not seamless for you. All comments submitted on this EA have been evaluated and considered as WSDOT and FHWA determine an appropriate environmental decision and plan forward for the project. The 30-day public comment period applied to everyone, including government agencies.

Comment 19 -2

Second question is why do I have to do math to show I am human?

Response 19-2

The online open house form asks the math question (x + 2 = 5) to ensure that you are not a computer "bot".

Comment 20 -1

To access this "FORM" I have to select a button called "FEEDBACK". This is not feedback, I should be submitting my testimony for the NEPA process which I was told all along that would be the case. WORDS MATTER.

Response 20-1

Thank you for your comment. This will enable WSDOT to improve the WSDOT Engage tool for future use.

Comment 20 -2

Why do I have to do math to answer if I am human?

Response 20-2

Please see response 19-2.

Comment 21-1

No information of any detail as to the mitigation on the river. All of this appears to be secretive and selected audience. I oppose any of my tax dollars to go towards putting ANY logs in the river when they are needed to mitigate this bridge of past or present or future. For the agencies or the tribes that want the logs they must submit their own NEPA process to address that and provide their own funding to mitigate. The NPS is not satisfied with this NEPA process; why can't the truth be told in a real open house to identify the failure of this infrastructure to get the job done and not continue to delay the disaster in the works?

Response 21-1

River mitigation is still in design development and has not been finalized. Information provided in the open house and the EA for review is current and at a level that WSDOT feels is sufficient to evaluate the significance of overall project impacts. The in-river mitigation compensates for the construction, demolition, and operational impacts of the project. Compensatory mitigation is not optional and will be required conditions of project permits and approvals. WSDOT follows FHWA regulation to ensure the NEPA evaluation and decision considers compliance with all relevant federal regulations, including public engagement.

Comment 21-2

Why do I have to do math to answer if I am human?

Response 21-2

Please see response 19-2.

Comment 22-1

We the affected public were promise all the details would come out in NEPA. But that isn't true. Where are the attachments from the several federal agencies that I suspect are calling for river mitigation; as stated in the letters attached to this blind NEAP process but no attachments included in this NEPA?

Response 22-1

Mitigation for in-water work and related impacts from construction, and demolition and operation of the new bridge is required pursuant to Section 404 of the Clean Water Act and the Washington State Hydraulic Code. WSDOT is responsible for developing a mitigation proposal that provides adequate compensatory mitigation to accompany the proposal for the new bridge.

Comment 22-2

Why do I have to do math for being human?

Response 22-2

Please see response 19-2.

Comment 23 -1

What assessments have been done by any mitigation measures that could/can affect the two county road systems in the affected area?

Response 23 - 1

The US 101 Elwha River Bridge replacement project should have minimal effect on surrounding county roads as the new bridge is being built offline. The only significant planned closure is a proposed 9-day closure of US 101 near Olympic Hot Springs Road where travelers will detour via Little River Creek Road. Crews will work to keep any closures or significant delays to a minimum.

Comment 23 -2

Why was only a tribe consulted with by the contracted consultant company that drafted the mitigation and the logs?

Response 23 - 2

River mitigation and proposed engineered log structures were included in the NEPA EA for the purpose of soliciting input of public, agencies, tribes, or other interested parties.

Comment 23 -3

Why is mitigation required for this bridge, what aspects of the bridge require something needs to be done in the river to offset the impact of the bridge and identify what those aspects are?

Response 23 - 3

In-river mitigation is necessary due to large access platforms of rock to be placed in the river at the piers for construction access, construction of diversion dams in the river channel, diversion

of the course and flow of the river during demolition, dropping all or part of the bridge into the river channel and restricting the flow and course of the river with two new in-water piers. Compensatory mitigation of these impacts will be necessary to obtain Section 404 of the Clean Water Act and State Hydraulic Code permits.

Comment 23 -4

Why does this process continue to not acknowledge or address the mitigation that was mandatory for the removal of the upstream dam by the federal government that wasn't done in any level of detail to demonstrate the problem the bridge is in now is due to that federal action...a wild river impacting a bridge that was designed and built for a controlled river...and then never to take responsibility to build a bridge, in this case a free span bridge without post in the river itself that would continue to be threatened by a wild river, similar to the two bridges further downstream below the previous two dams?

Response 23 - 4

Neither the federal government nor WSDOT envisioned the Elwha River Restoration Project would place the US 101 bridge at risk. At the time of early involvement for the Elwha River Restoration project, the best information available identified the bridge foundations were securely founded on bedrock and the actual scour was greater than estimated.

Comment 23 -5

Why does this process continue to not address that or even identify the public requested this some several years ago to evaluate and hold the federal government responsible for an action of their's that doesn't take a lot of engineering studies to determined the threat currently faced and will continue to be a threat?

Response 23 - 5

The effect of the river restoration project on this 95-year-old bridge was not foreseen. The effect of river restoration on the structural condition of the bridge cannot be attributed to any single factor. The bridge is decades past its original intended life span and is past due for replacement irrespective of the Elwha River Restoration project.

Comment 23 -6

Why does there need to be any mitigation to the wild river if a bridge is built free span?

Response 23 - 6

The bridge design does not free span the river. The new bridge has 4 drilled shaft piers, 2 of which will be located in the river.

Comment 23 -7

Why do I have to do math to answer if I am human?

Response 23 - 7

Please see response 19-2.

Comment 24-1

How will this project proceed in a timely manner when it is likely a tribal interest will delay it further without treaty justification to be friendly with the citizens and not stall for lengthy periods of time; much like what has occurred to date as an opinion.

Who will be held accountable when the NPS requires another NEPA process for the failure of this NEPA process to address what NPS determines is required because they are the landowner, and have never satisfied the federal act that gave the landownership over to the management by the NPS but the agency has failed to dispose of these lands in a timely manner with not public know process as to when or if the agency ever will be? The State has an interest as per the act and the "right of way" requirements by the NPS will stall this infrastructure requirement into the abyss without a sound NEPA process, fact in point.

Response 24-1

WSDOT has and will continue to collaborate closely with the Lower Elwha Klallam Tribe and Olympic National Park to expeditiously move this project forward. The NPS is a cooperating agency on this project and assisted with drafting the EA and the decision document. The NPS has reviewed all final documentation and will be adopting the WSDOT and FHWA EA and FONSI. The NPS will work closely with WSDOT and FHWA to assist in the acquisition of a Highway Easement Deed in order to construct the bridge on Elwha Project Lands which are currently under NPS management until turned over to a permanent entity. WSDOT is pursuing all necessary permits and approvals for the project to proceed, and are designing the new bridge constructed across the Elwha River to last for generations to come.

Comment 24-2

Why do I have to do math to answer if I am human?

Response 24-2

Please see response 19-2.

Comment 25 - 1

Where is the budget for this project beyond the totals column presented on the web site? What is the cost for mitigation? What is the cost for cultural resource requirements? What is the cost for inflation for delaying the construction of the bridge by a convoluted process? What would be the cost for a free span bridge that includes not needing mitigation of logs in the river system? How much is being allocated for tribal restitution of any sort (habitat, cultural, other negotiated compensation or payment)? How much is allocated for the county, including negotiation and consultation for the two county road systems in the affected area?

Response 25 – 1

Allocated funding amounts for the US 101 Elwha River Bridge replacement project are posted on our project page at www.elwhariverbridge.com under funding and budget information. The costs may fluctuate as bids come in and total project costs are calculated throughout the entire construction phase.

Comment 25 – 2

Why is the City of Port Angeles a party to this when they can't even address their own traffic flow issues; why do they have anything beyond the general public to say about this project?

Response 25 - 2

WSDOT works with stakeholders as a matter of practice, and the City of Port Angeles is a key partner in discussions as one of the closest jurisdictions and the largest population center near the project site.

Comment 25 - 3

Why is the cultural resource write up in the project website about apparently the Old Elwha Resort so abusive and disconnected; not holding the responsible agency, the NPS and the State Historical officer responsible for the destruction of the site beyond what remained when some of the site was destroyed by fire?

Response 25 – 3

The role of NEPA is to inform the public of the resources in the area and the impact of the project on those resources.

Comment 25 - 4

Why do I have to do math to answer if I am human?

Response 25 - 4

Please see response 19-2.

Comment 26-1

How will all my comments and testimony submitted through this method be addressed to me, the affected party? Will I get copies of what I submitted and if now how do I get copies so that I can hold this NEPA process accountable? Will the federal agencies respond to my comments and testimony given that NEPA is Federal?

Response 26 - 1

Please see response 19-1.

Comment 26-2

And why is it that WSDOT can build a bridge just a few miles west on the same highway to replace a fish passage culvert issue in such a timely manner but yet drag this out to build a bridge to replace a failed, opinion based on experience and fact, federal project to remove two dams and restore the Elwha River while not held accountable for the whole environmental impact of that action, the human impact? But why can a 180 foot bridge be built to replace a culvert; why is that an environmental priority over just replacing a bridge and one that could be done with a free span that is of even more environmental benefit to the outlet of Indian Creek that the 180 bridge on the same creek is pretty much a engineering waste of effort and money?

Response 26 - 2

The Elwha River is a large complex and dynamic river in comparison to Indian Creek. The design and construction of this major three span bridge is substantially more complex and involved than the Indian Creek project. There are complexities on the Elwha River Bridge Replacement Project not found on the Indian Creek culvert replacement project referenced in the comment. The complex nature of the bridge replacement project requires more time for studies, design, stakeholder engagement, and consultation.

Comment 26-3

Why do I have to do math to answer if I am human?

Response 26 - 3

Please see response 19-2.

Comment 27 – 1

Why is a log jam being placed mid channel upstream of the bridge? Why analysis has been done to determine the impact of such log piles on the Olympic Hotsprings Road and why wasn't the road manager-the county-consulted with on such impact potential or further degradation of the local infrastructure in the real affected area and not just some cultural affected area under Section 106 consultation?

Response 27 - 1

Please see responses 5, 21, and 23 regarding engineered log jams. A no-rise analysis was conducted in association with engineered log jam design and showed the river does not rise above thresholds that would impact or threaten the county road. WSDOT will coordinate with the County during the permitting process and once construction begins.

Comment 27 – 2

Why are all the log jams proposed downstream from the bridge to the current off channel that serves the boat ramp at the end of a county road? How will any of these log jams be liable for the free recreation use and safety of river recreation? Who will have that liability? With the removal of the dams, is this river segment now classified as navigable under the purpose of who owns the river (i.e. WDNR aquatics); asked for the purpose of the federal agency along with any treaty aspects attempting to control the use of the river?

Response 27 - 2

ELJ locations have been selected to provide maximum benefit and mimic natural river conditions. It is WSDOT policy to consider recreational uses when developing structures for use in rivers. Recreation on the river is generally allowed but some area remained closed due to Elwha River Restoration. The Olympic National Park ranger can provide the most current information on river closures.

Comment 27 - 3

How does any of the stated mitigation benefit or offset the impact to the outlet of Indian Creek, both habitat and upstream affect to private property?

Response 27 – 3

Engineered Log Jams are proven to provide complex riverine habitat that will support all stages of fish life.

Comment 27 - 4

Why do I have to do math to answer if I am human?

Response 27 - 4

Please see response 19-2.

Comment 28-1

What is the accountability to when this bridge will get built, in aspect to agencies, NGO with claimed environmental interest, tribal special interest to include more money in the pockets, or others that will likely stall this even further as what appears to be the case so far? When is any leadership going to step up and say enough is enough, build the bridge and if the piles in the river are the root problem to all these other invested interest that includes habitat impacts then hold the federal government responsible to foot the bill for a free span bridge and get it built now!!!

Response 28-1

WSDOT is required to follow state and federal regulations regarding public works construction, contracting, and design and will do so on this project. While review and approval processes for complex project public works such as this can be time consuming, WSDOT remains committed to expeditiously moving the project forward.

Comment 28-2

Why do I have to do math to answer if I'm human?

Response 28-2

Please see response 19-2.

Comment 29-1

How much conversation has this NEPA process held with the Clallam County Commissioner for the 3rd district, and what has been the result of that conversation if so?

Response 29-1

WSDOT has reached out to stakeholders and interested parties throughout the development of this project with targeted presentations and outreach, including Clallam County elected officials.

Comment 29-2

How will all the testimony, comments, submissions to this NEPA be provided to the public in their raw form and not a summary, along with the responses?

Response 29-2

Please see response 19-1.

Comment 29-3

Why do I have to do math to answer if I am human?

Response 29-3

Please see response 19-2.

Comment 30

Ed Bowen,(spells out email address), it is 11:59 on the 18th of August. Somewhere in all this minutia is some kind of requirement that twelve noon on the 18th is the cut off, so this is my comment via telephone. Where are all my comments that I have submitted through the online portal system? Where will I get a copy of all those? And how will I get a response to those as a matter of record because this open house is a non- human process. This voicemail is not human, it's a machine. I've got 10 seconds left before 12 noon, I need to know where my comments are as written, and not a summary. Twelve noon. Bye.

Response 30

Please see response 19-1.

Comment 31

Comment about the new Elwha River Bridge. If the reiver is still closed to fishing when the new bridge is build, and if the bridge has a sign about fishing, then the sign should not say "no fishing from bridge" like the current sign, because that can make people think the river is open. I've seen people fishing the Elwha and they thought the river was open. I have also found fishing gear on the Elwha. The sign should just say "no fishing". If the river opens later to fishing, the sign could be changed to "no fishing from bridge". Respectfully Edwin Johnson

Response 31

Thank you for your comment. The sign referred to is a legacy from pre-Elwha River Restoration project times. WSDOT will coordinate with the State Department of Fish and Wildlife on appropriate and necessary signage related to fishing regulations.

Comment 32

Upon reading the EA for the US 101 Elwha River Bridge Replacement Project I have a few comments/additions to the document:

Section 3.4. Fish: "Pacific (Lampetra tridentate) and brook (Lampetra richardsoni) lamprey have also been documented in the Elwha River." Is an incorrect statement. The scientific name for Pacific lamprey is Entosphenus tridentatus and there have not been any Brook lamprey documented in the Elwha River. The scientific references are : Hess, J.E., R.L. Paradis, M.L. Moser, L.A.Weitkamp, T.A. Delomas, S.R. Narum. 2021. Robust Recolonization of Pacific Lamprey following dam removals. Transactions of the American Fisheries Society 150:56-74. and Moser, M.L. and R.L. Paradis. 2017. Pacific Lamprey restoration in the Elwha River drainage following dam removals. American Currents 42:3-8. 2. Table 1 pg 41. pg 43 and pg 44 of the EA says that the action area isn't critical Chinook habitat. That is incorrect! Both Chinook and Steelhead spawn in the action area. I worked as a Project Biologist for the Lower Elwha Klallam Tribe for 14 years and have done numerous Chinook spawner surveys and have documented Chinook spawning in the action area. I have spoken with Mike McHnery, Habitat Biologist for the Lower Elwha Klallam Tribe and he told me that he also made comments to this document stating the same thing. The Lower Elwha Klallam Tribe has the Chinook spawner survey data.

Thank you for the opportunity to comment and I am available if you would like to discuss my above comments.

Response 32

Thank you for your comment. We will update the scientific name of the lamprey in the Errata. ESA considers critical fish habitat at the time of evaluation. The action area is not Puget Sound Chinook critical habitat because there was no fish passage past the dams when PS Chinook salmon were listed under the ESA in 1999. While designated critical habitat in not found in the project area, the ESA consultation does address impacts on Puget Sound Chinook and other ESA listed species.

Attachment B -- Errata to the Environmental Assessment

The following corrections apply to the US 101 Elwha River Bridge Replacement Project Environmental Assessment (EA) issued on July 19, 2021. Changes to the EA text are identified by their corresponding page number in the document's original published edition. Underlined text is added, strike-through text is deleted.

Cover page

US 101 Elwha River Bridge Replacement
Submitted pursuant to 42 U.S.C. 4332(2)(c) and 23 CFR Part 771

Page 2 – Section 1.2.3 Cooperating Agencies and the Decision-Making Process – Second Paragraph

~~NPS Pacific West Regional Director~~
NPS Regional Director, Interior Regions 8, 9, 11, and 12

Page 16 – Section 3.3 Cumulative Impacts Scenario, 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.~~

Past Actions/Projects

U.S. Highway 101 at Lake Crescent and East Beach Road Rehabilitation/EA implementation was completed in spring June 2020. 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. At the time of release of the U.S. 101 Elwha River Bridge Replacement/EA, this project is a past action, however, impacts from the U.S. Highway 101 at Lake Crescent and East Beach Road Rehabilitation/EA is complete and would have no additional impacts on the bridge relocation project.

Page 17 – Section 3.3 Cumulative Impacts Scenario, Present Actions/Projects

~~**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.~~

Past Action/Projects
The "Temporary Off-road Access for Geotechnical Investigation/EA" was an NPS project, not WSDOT. Additionally, the geotechnical EA was completed in September 2018 and implementation began that fall. Monitoring of the drill sites is still occurring and will continue to occur until the Olympic Hot Springs Road project is complete. All construction-related impacts for this EA are complete and would have no new or additional impacts on the US Hwy 101 WSDOT Elwha River Bridge Relocation project.

Page 32 – Section 3.4.5 Fish

Pacific ~~(*Lampetra tridentate*)~~ (*Entosphenus tridentatus)* ~~and brook (*Lampetra richardsoni*)~~ lamprey have also been documented in the Elwha River.

Page 33 – Section 3.4.5 Fish – second paragraph

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.

Page 41 – 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~~ none in action area
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	USFWS	Designated; ~~present in action area~~ none 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~~ none in action area

Page 48 – 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~~ n/a
Marbled murrelet	Threatened	USFWS	Not Likely to Adversely Affect	~~No Effect~~ n/a
Streaked horned lark	Threatened	USFWS	No Effect	~~No Effect~~ n/a
Yellow-billed cuckoo	Threatened	USFWS	No Effect	~~No Effect~~ n/a
Taylor's checkerspot butterfly	Threatened	USFWS	Not Likely to Adversely Affect	~~No Effect~~ n/a

ESU = Evolutionarily Significant Unit

DPS = Distinct Population Segment.

Page 50 – Effects of the Build Alternative on Cultural Resources – second paragraph

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.

Page 51 – Mitigation and Conclusion – second sentence

WSDOT ~~is currently undergoing Section 106 consultation~~ has consulted with the LEKT and Department of Archeology and Historic Preservation (DAHP), pursuant to Section 106, 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.

Page 68 – 3.4.13 Public Access -first paragraph

The Elwha River has been closed to all fishing since 2012 and will remain closed to fishing at least through July ~~2021~~ 2022.

Page 75 – View 2 – View from South East Corner of Bridge looking East:

Page 79 – 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. See Section 3.4.2 Vegetation for details on existing vegetation in the project area.

Page 85 – Effects of the Build Alternative on GHG emissions

~~Construction of the project is currently planned to last 75 years from 2020 to 2095.~~

Attachment C – SEPA Adoption and DNS

DETERMINATION OF NONSIGNIFICANCE AND ADOPTION OF EXISTING ENVIRONMENTAL DOCUMENT

Description of current proposal: The US 101 Elwha River Bridge Replacement Project proposes to fully replace the US 101 crossing over the Elwha River, located west of Port Angeles in Clallam County, Washington. The purpose of the bridge replacement is to provide safe, long-term access across US 101. The route provides the primary highway access for the communities and visitors across the Olympic Peninsula.

Proponent: Washington State Department of Transportation (WSDOT)
Title of document being adopted: US 101 Elwha River Bridge Replacement Environmental Assessment
Date adopted document was prepared: June 30, 2021
Description of document being adopted: Environmental Assessment
The document is available for viewing online at:
https://wsdot.wa.gov/projects/us101/elwhariverbridgereplace/environmental-assessment or paper copies can be requested by calling (360) 570 - 6707.

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

X This DNS is issued under WAC 197-11-340(2); the lead agency will not act on the proposal for 14 days from the date below. Comments must be submitted by October 14, 2021.

We have identified and adopted this document as being appropriate for this proposal after independent review. The document meets our environmental review needs for the current proposal and will accompany the proposal to the decision maker.

Washington State Department of Transportation
Jeff Sawyer
Olympic Region Environmental Manager
(360) 570-6701
P.O. Box 47440, Olympia, Washington 98504-7440

Date: September 24, 2021

Signature: Jeff Sawyer Digitally signed by Jeff Sawyer Date: 2021.09.24 14:03:21 -07'00'

Attachment D - FONSI Distribution List

Native American Tribes
Lower Elwha Klallam Tribe
Port Gamble S'Klallam Tribe
Jamestown S'Klallam Tribe
Makah Tribe

Federal Agencies
U.S. Forest Service
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 Ecology
Office of Attorney General
Department of Fish and Wildlife
Department of Natural Resources

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 SEPA Reviewer
City of Forks
Forks Public Library
Port Angeles Public Library

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

Interested Party
Ed Bowen

Attachment E - Section 4(f) Evaluation

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

September 21, 2021

U. S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

Table of Contents

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.

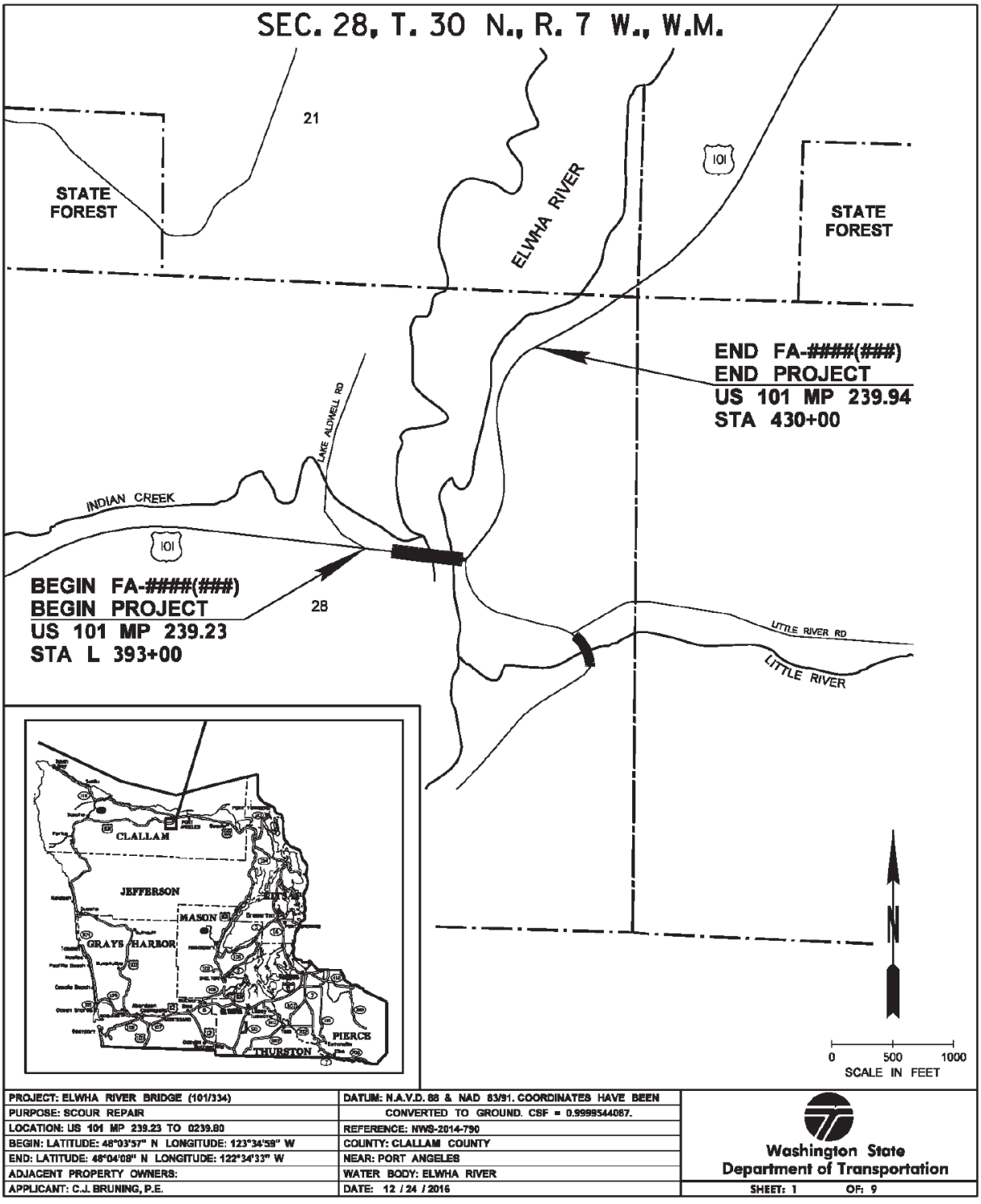


Figure 1. Vicinity Map

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 evaluated impacts of the proposed project on natural, cultural and socioeconomic resources, visitor use and experience and park operations. The EA did not reveal significant impacts to the environment from the project and does not require an Environmental Impact Statement and Record of Decision be prepared. The FHWA has documented this decision in this Finding of No Significant Impact (FONSI).

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.

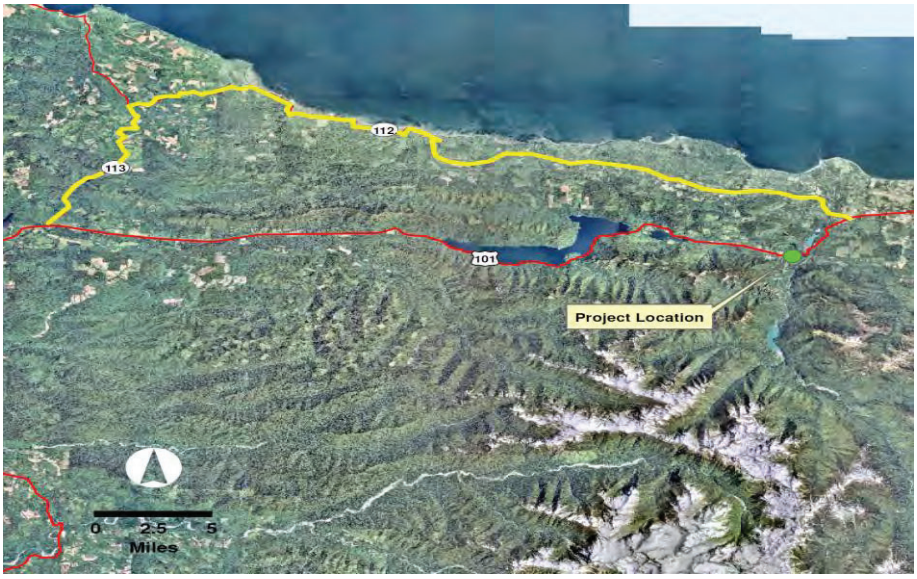
2.1 No Build Alternative

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

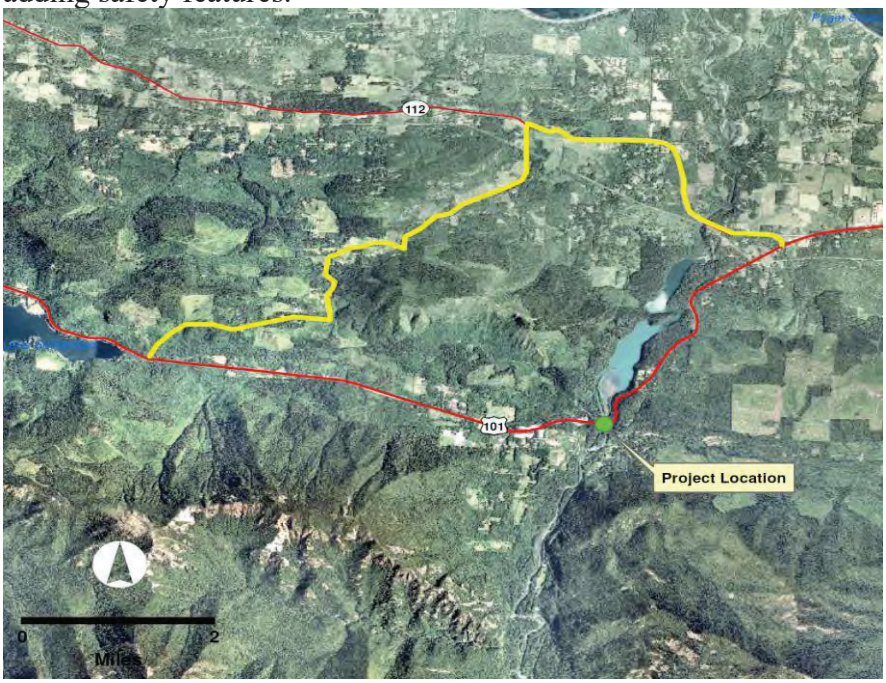
This alternative would result in the permanent use of all three archeological sites (45CA774, 45CA775, & 45CA727 see Chapter 3 for descriptions) within the current APE due to bridge demolition. This alternative would result in unknown but likely impacts to 4(f) resources due to the upgrades to SR 112/113. 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.

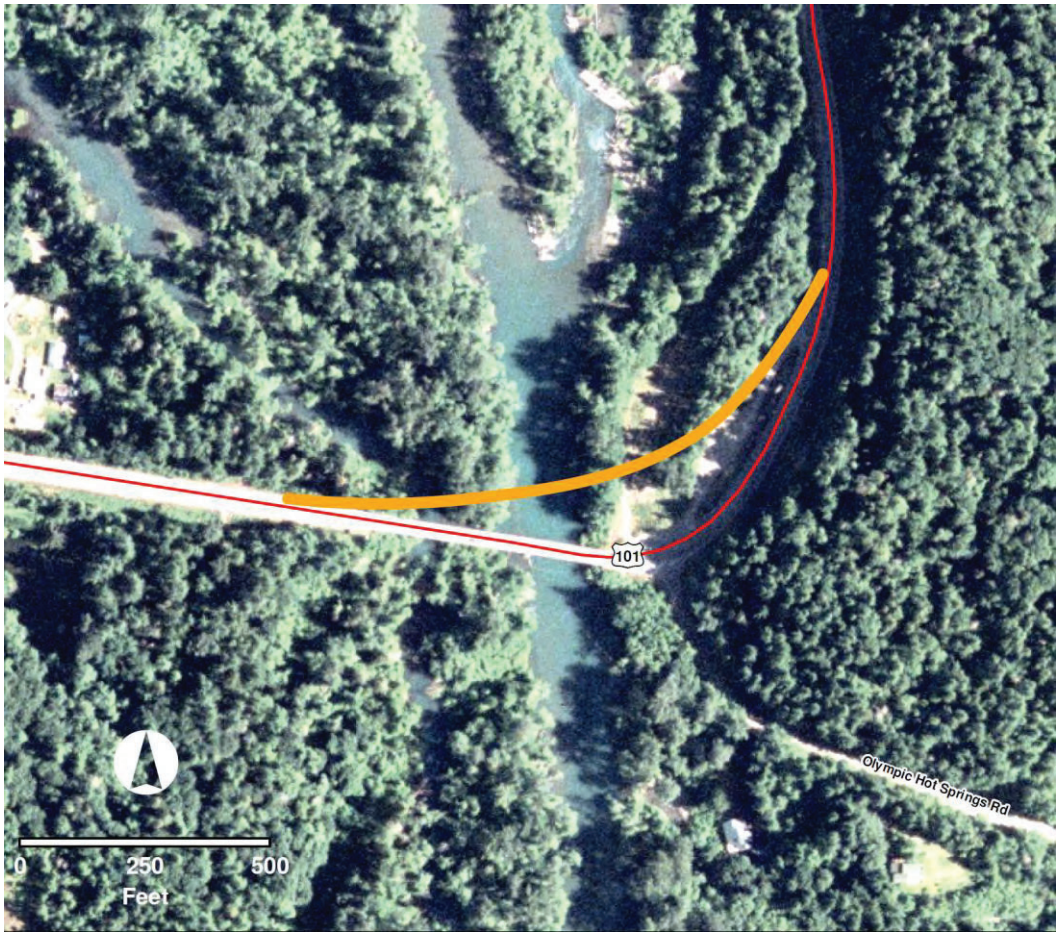
Alternative 7

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 expanding 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.

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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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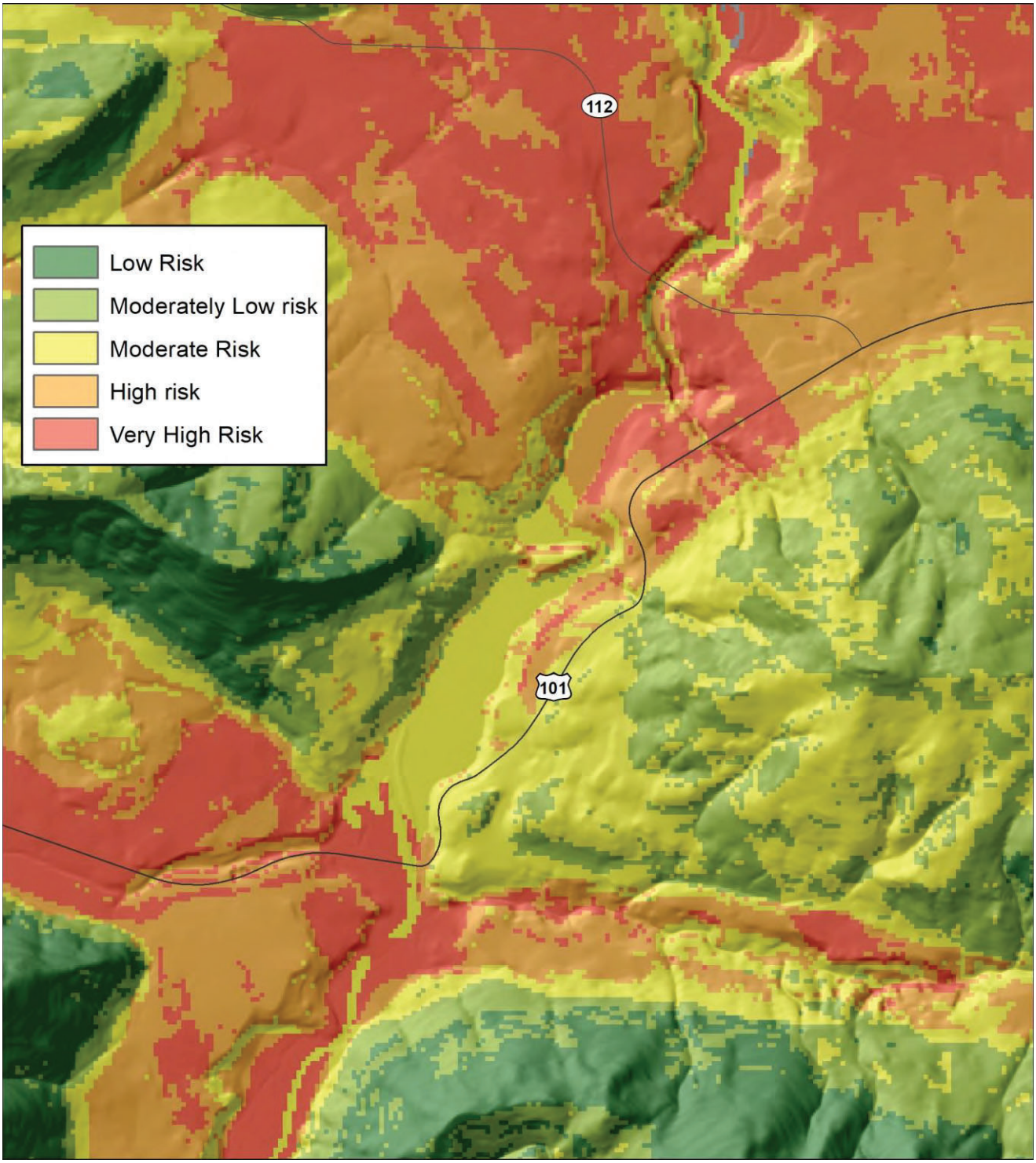
Appendix B — Archaeological Predictive Model Map



Attachment F - Determination of Non-Impairment

Olympic National Park
WSDOT US 101 Elwha River Bridge Relocation
Environmental Assessment

DETERMINATION OF NON-IMPAIRMENT

Introduction

The National Park Service (NPS) *Management Policies 2006* (section 1.4) requires an analysis of potential effects to determine whether the Selected Alternative would impair a park's resources and values. The fundamental purpose of the national park system, established by the *Organic Act* and reaffirmed by the *General Authorities Act*, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006*). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the trends in the effects of the impact in question and other impacts not directly related to this project.

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities, NPS administrative activities, or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. The description of the park's purpose and significance is found below and is subject to the no-impairment standard.

Description of Park Purpose and Significance

Purpose of Olympic National Park

Olympic National Park (ONP or "the park") was "set apart as a public park for the benefit and enjoyment of the people" (35 Statute 2247, June 29, 1938). According to House Report 2247 (April 1938), the purpose of the park is to:

…preserve for the benefit, use, and enjoyment of the people, a large wilderness park containing the finest sample of primeval forests of Sitka spruce, western hemlock, Douglas fir, and western red cedar in the entire United States; to provide suitable winter range and permanent protection for the herds of native Roosevelt elk and other wildlife indigenous to the area; to conserve and render available to the people, for recreational use, this outstanding mountainous country, containing numerous glaciers and perpetual snow fields, and a portion of the surrounding verdant forests together with a narrow strip along the beautiful Washington coast.

Significance of Olympic National Park

- Olympic National Park protects several distinctly different and relatively pristine ecosystems that provide both ecological and scenic diversity to the Olympic Peninsula, ranging from wild Pacific coast and islands to densely forested lowlands to the glacier-crowned Olympic Mountains. Views of the mountain range define the landscape for great distances in all directions, and the rugged beauty of the coastline and verdant grandeur of the rain forest have inspired people for generations.
- The ecosystems protected within Olympic National Park contain a unique array of habitats and life forms resulting from thousands of years of geographic isolation, along with extreme gradients of elevation, temperature, and precipitation. More than a dozen animals and plants on the Olympic Peninsula exist nowhere else in the world, and the park is key to maintaining the populations of these taxa.
- Olympic National Park contains some of the last remaining undisturbed, contiguous aquatic habitat throughout the range of several west coast fish species. The park protects 12 major river basins, more than 3,500 miles of rivers and streams, more than 300 high mountain lakes, and 2 large lowland lakes. As a consequence, the park is entrusted with the stewardship of numerous unique stocks of Pacific salmonids and other native freshwater fish species. Salmon are a keystone species of the park's forest and aquatic ecosystems and are deeply woven into the cultural fabric of the Pacific Northwest.
- One of the largest wilderness areas in the contiguous United States is designated within Olympic National Park. By today's wilderness quality scale, the Daniel J. Evans Wilderness is superb. Few, if any, National Park Service areas in the contiguous United States can approach or surpass its near-pristine nature, grandeur, immensity, and variety of resources, which include glacier-covered mountains, subalpine lakes and meadows, extensive river valleys, old-growth coniferous forests, and the tremendously diverse wild Pacific coastline. The wilderness character of these lands is of inestimable value and among the most precious of the region's resources.
- Olympic National Park contains the finest remaining stands of old-growth temperate coniferous forest in the contiguous United States, including one of the finest remaining examples of temperate rain forest in the United States. These extensive forests of ancient and immense trees provide important habitat for complex communities of plants and animals, including a number of imperiled species.
- The Olympic rocky intertidal community is considered to be one of the most complex and diverse shoreline communities in the United States. Olympic National Park includes about 1,400 square miles of intertidal, island, and shoreline habitat and contributes to a large protected landscape of coastal and ocean habitats, including approximately 64 miles of coastline, 52 of which are along designated or potential wilderness.

- Olympic National Park is home to the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have not only sustained high densities of elk, but have also preserved the natural composition, social structure, and dynamics of this unique western forestland subspecies of elk.
- Olympic National Park manages a variety of cultural resources, from ancient village sites to historic structures, which retain local, regional, or national significance. Eight federally recognized tribes (the Port Gamble S'Klallam Tribe, Skokomish Indian Tribe, Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribe, Makah Tribe, Quileute Nation, Hoh Tribe, and Quinault Indian Nation) have, since time immemorial, sustained strong ties to the Olympic Peninsula and what is now the park. Hundreds of archeological and ethnographic sites attest to more than 12,000 years of continuous use and connection to the park landscape. Park resources continue to provide material, spiritual, and cultural sustenance to contemporary descendants as they have for millennia.
- The park serves as a recreational "backyard" for millions of people in the greater Puget Sound and Olympic Peninsula regions, in addition to attracting recreating visitors from across the nation and world.

Impairment Determinations for the Proposed Action Alternative

Some elements of the environment were eliminated from further consideration due to either their lack of presence within the project area or the project having no effect or no noticeable effect on these elements. These include agriculture/prime and unique farmlands, mineral extraction, and paleontological resources. After dismissing the above topics, topics remaining to be evaluated for impairment include geology and soils, vegetation, water resources, wetlands, fish, wildlife and wildlife habitat, threatened and endangered species, cultural resources, acoustic environment, social and environmental justice, transportation, land use, public access, visual quality, section 4(f) of the U.S. Department of Transportation Act of 1966, hazardous materials, climate change, and greenhouse gas emissions. These topics are discussed below.

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 highwater 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.

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.

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 Best Management Practices (BMPs) outlined in the Temporary Erosion and Sediment Control (TESC) Plan sections of WSDOT's Highway Runoff Manual and Environmental Manual.

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.

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.

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 has 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 to 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.

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 US 101 Elwha River Bridge Replacement - Environmental Assessment 24 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.

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.

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 affected 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.

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 groundclearing 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.
Water quality effects would be limited by the use of 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 offset 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 sheet flow 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.

Implementation of the Build Alternative would US 101 Elwha River Bridge Replacement - Environmental Assessment 29 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.

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.

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 in the EA.

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.

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 in the EA).

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.

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 affected 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.

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 and 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 groundclearing 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.

Water quality effects would be limited by the use of 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 offset 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.

Implementation of the Build Alternative would US 101 Elwha River Bridge Replacement - Environmental Assessment 29 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.

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.

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 in the EA.

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.

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 (see Figure 5 in the EA).

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.

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 (*Entosphenus tridentatus*) 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 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.

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.

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, BMPs to reduce the risk of delivering sediment to waterbodies, BMPs to reduce the risk of introducing pollutants to waterbodies, and BMPs 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 in the EA) 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.

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.

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*).

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.

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.

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.

Threatened and Endangered Species

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

Chinook Salmon, Steelhead Trout, Bull Trout, and Eulachon

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.

Northern Spotted Owl and Marbled Murrelet

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.

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 in the EA.

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.

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 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.

WSDOT has consulted with the LEKT and Department of Archeology and Historic Preservation (DAHP), pursuant to Section 106, 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.

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.

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 3-decibel noise reduction to the trail. Therefore, no noise impacts are anticipated on the trail. Table 3 in the EA shows the predicted noise levels at the receiver location.

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.

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 in the EA 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.

The closest elementary school is Dry Creek Elementary School. School demographic data is summarized in Table 5 in the EA. “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.

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 a detour would be 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.

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.

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.

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 inwater 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.

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

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 offseason, 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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 of the EA.

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 the Ecology 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.

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 snowpack, 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.

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 (CO2), methane, and nitrous oxide. Any process that burns

fossil fuel releases CO2 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 CO2 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.

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 in the EA). 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.

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.

Conclusion

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the Selected Alternative.

References

All references are provided in the EA.