



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
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Lacey, Washington



In Reply Refer to:

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X-Ref: 01EWF00-2017-F-1500

July 26, 2023

Ralph J. Rizzo
U.S. Department of Transportation
Federal Highway Administration
Suite 501 Evergreen Plaza
711 South Capitol Way
Olympia, Washington 98501-1284

Dear Mr. Rizzo:

Subject: Reinitiation of Endangered Species Act Section 7 Formal Consultation for the US
101 Elwha River Bridge Replacement Project

This letter transmits the U.S. Fish and Wildlife Service's (USFWS) revised effects analysis and amended Incidental Take Statement (ITS) to the 2018 Biological Opinion (Opinion) (Reference number 01EWF00-2017-F-1500) for the US 101 Elwha River Bridge Replacement Project (Project) located in Clallam County, Washington.

The Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is requesting reinitiation of consultation to address effects not previously considered to bull trout (*Salvelinus confluentus*), and bull trout critical habitat resulting from additional activities proposed as part of the action, and the Concurrence section addresses additional effects to northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), and Taylor checkerspot butterfly (*Euphydryas editha taylori*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). We received your request for reinitiation of formal consultation for bull trout and bull trout critical habitat, and concurrence on marbled murrelet and northern spotted owl on August 2, 2022. We subsequently received your request for concurrence for Taylor's checkerspot butterfly on October 17, 2022.

PACIFIC REGION 1

IDAHO, OREGON*, WASHINGTON,
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS

*PARTIAL

The Project will also require a permit from the U.S. Army Corps of Engineers (USACE) and will use restoration materials obtained from the Olympic National Park (ONP) native plant nursery. The revised Project scope includes mitigation via the installation of engineered log jams (ELJ) in the Elwha River below the newly constructed US 101 bridge, as proposed by the Lower Elwha Klallam Tribe (LEKT).

Consultation History

The following is a summary of important events associated with this consultation:

- On March 19, 2018, the USFWS issued an Opinion (01EWF00-2017-F-1500). The 2018 Opinion addressed the Project's effects on bull trout and bull trout critical habitat, and included concurrences for northern spotted owl, marbled murrelet, and Taylors checkerspot butterfly.
- On June 29, 2022, the USFWS received a request for consistency review from WSDOT and the FHWA under the Statewide Programmatic Opinion (01EWF00-2014-F-0286; 01EWF00-2014-FC-0287; XRef 2022-001119) to complete geotechnical work within the Elwha River in advance of the construction of ELJs proposed as part of the revised Project. The geotechnical work was proposed to be completed in the dry to avoid an aquatic zone effect for this proposed action and would be completed in the 2022 in-water work window (IWWW).
- On July 1, 2022, the USFWS provided a consistency review response (2022-0059191) confirming the geotechnical work as proposed would be consistent with the Statewide Programmatic with an effect determination of "may affect, not likely to adversely affect" for potential effects to marbled murrelet, northern spotted owl, and Taylor's checkerspot butterfly. Geotechnical exploration required to complete the ELJ installation was completed during the 2022 IWWW (Molenaar, in litt. 2023a).
- On August 2, 2022, the FHWA submitted a revised Supplemental Biological Assessment (BA) with a request to reinstate formal consultation to address effects to bull trout, bull trout critical habitat, marbled murrelet and spotted owl not previously considered as a result of activities added to the Project. However, the request inadvertently omitted a request for concurrence for Taylor's checkerspot butterfly.
- On October 17, 2022, the USFWS received from the FHWA an addendum to the August 2022 Supplemental BA with a request for concurrence for Taylor's checkerspot butterfly for the Project.
- Additional information necessary to initiate consultation was received on January 11, 2023, clarifying how piers described in prior opinion are described in current project description.
- Additional information to clarify the project description of the proposed action was provided via numerous emails from WSDOT on April 3, April 28, May 1, May 2, May 3, May 4, May 10, May 18, May 22, May 23, May 25, and May 26, 2023.

Concurrences: Northern Spotted Owl, Marbled Murrelet, and Taylor's Checkerspot Butterfly

The 2018 Opinion included concurrences with FHWA's affect determinations of "may affect, not likely to adversely affect" for northern spotted owl, marbled murrelet, and Taylor's checkerspot butterfly (USFWS 2018, pp. 2-4) and these concurrences are incorporated by reference.

The overall extent of the action area has not changed with the addition of the ELJs. The proposed modifications to the Project to construct the ELJs expands the terrestrial noise extent from Project activities (access roads and ELJ construction). Construction of the ELJs will result in short-term elevated noise and activity levels associated with the use of heavy equipment that could result in disturbance to northern spotted owl and marbled murrelet. However, in September 2021, WSDOT biologists conducted a field assessment of the expanded extent of noise from Project activities, including ELJ construction, and determined there are no suitable nest trees within 328 feet for murrelets and within 195 feet for northern spotted owl. The likelihood of disturbing nesting northern spotted owls or marbled murrelets is therefore extremely unlikely, and therefore Project effects continue to be discountable for both species.

The Project as modified will result in ground disturbance and vegetation removal. However, as with the original proposal described in the 2018 Opinion, given the lack of suitable habitat and larval host plants for Taylor's checkerspot butterfly, and the distance to the nearest documented Taylor's checkerspot butterfly location, the likelihood of removing or degrading potential habitat or killing individual butterflies as part of the Project activities remain extremely unlikely and, therefore, discountable.

SUMMARY OF THE PROPOSED ACTION

A detailed description of the previously consulted-on action to construct a new bridge north (downstream) of the existing US 101 Elwha River Bridge, and to demolish and remove the old bridge can be found in the 2018 Opinion (USFWS 2018, p.5 – 20) and is incorporated by reference. The need for the bridge replacement arose because the current bridge experienced significant scour following the removal of the Elwha River Dams. For the purposes of this document the term "bridge replacement" will refer to both the construction of the new bridge and the demolition and removal of the old bridge.

Activities of the proposed bridge replacement work that remain unchanged include the following:

- The reconstruction of 0.6 mile of US 101(0.2 mile west of the new bridge and 0.4 mile east of the new bridge), including the relocation of the intersection of US 101 and Olympic Hot Springs Road. Roadway demolition will be completed in conjunction with bridge demolition. Approximately 28,200 ft² of existing roadway will be removed and hauled off to an approved site.
- Approximately 3.27 acres of new and replaced pollution-generating impervious surface (PGIS), a net increase of 0.38 acre of PGIS.

- Installation of water quality treatment facilities along the new roadway segment to treat stormwater from 1.49 acres of the 3.27 acres of new PGIS (46 percent). Currently there is no water quality treatment within the Project limits.
- Approximately 6.7 acres of land outside the proposed roadway limits will be cleared and grubbed. Approximately 2 acres within the roadway zone will be hydroseeded and replanted with low-growing vegetation and 3.7 acres will be replanted using native forested planting sources from the ONP Native Plant Nursery. Of the 6.7 acres removed, 2.9 acres falls within the 200-foot riparian buffer zone of the Elwha River and Indian Creek, of which 1.8 acres will be replanted with riparian vegetation.

The Project modifications, updating the proposed action, include the following:

- Delay in Project construction by four years.
- Increased area of riparian impacts.
- Addition of mitigation for instream impacts via construction of ELJs.
- Increase area of temporary and permanent benthic impacts.
- Addition of temporary overwater shading.
- Increase in area of work area isolation, dewatering, and fish handling.
- Increase in extent of sedimentation and turbidity.
- Additional stormwater treatment.

Project Schedule Revision

The Project, initially scheduled for completion between June 2019 and September 2020, is currently delayed by four years and is scheduled to be constructed between June 2023 and September 2024.

It is anticipated two in-water work windows will be necessary to complete all 12 ELJs, constructed concurrent with bridge replacement work; however, the ELJs may be constructed independent of the bridge work. Each in-water work window is expected to occur from July 15 to August 30; however, this may be adjusted with early coordination between FHWA and USFWS. Work outside of the Ordinary High Water Mark (OHWM) may occur throughout the year.

WSDOT has requested an extended work window of June 15 to August 30 for 2024. For the purposes of this document we assume in water work will require 46 days in 2023 (July 15 to August 30) and up to 76 days in 2024 (June 15 to August 30) for a total of 76 days of in-water work, pending modification of applicable state permits.

Work planned for the 2023 and 2024 IWWW includes construction of temporary access roads and bridges, installation of cofferdams and diversions, dewatering of laydown areas, and construction of the ELJs. Installation of the waterward portions of the temporary construction access routes will occur during the 2023 IWWW. Removal of the landward portions of the temporary construction access pads and site clean-up and restoration will take place September 2024 after the end of the IWWW.

Riparian Impacts

The 2018 Opinion analyzed effects of the Project including the removal of 2.9 acres of riparian vegetation associated with the bridge replacement activities. Of the 2.9 acres, 1.8 acres would be replanted with native riparian vegetation, 0.7 acre would be replanted within the roadway zone with low growing woody vegetation, and the remaining 0.4 acre would be new roadway.

The revised proposal selects alternate access roads, lessening the riparian impacts from bridge replacement work by 0.22 acre. In addition, the revised Project will result in additional riparian impacts associated with the placement of large wood as mitigation for Project impacts from the bridge construction and demolition (see Engineered Log Jams section below). The construction of temporary access roads to access the ELJ locations will result in 1.29 acres of additional riparian impacts, which will increase the riparian impacts for the entire Project to 3.97 acres (an increase of 1.07 acres overall).

Of the 3.97 acres impacted for the overall Project, 3.57 acres will be restored with riparian vegetation sourced from the ONP Native Plant Nursery (Table 1).

Table 1. Riparian Impacts (acres) for Elwha River Bridge Replacement.

Activity	2018 Opinion	Proposed Action with modifications	Change (acres)	Acres Restored to Riparian Vegetation
Bridge Replacement	2.9	2.68	0.22 decrease	2.28
ELJ Construction	NA	1.29	1.29 increase	1.29
Total Riparian Impact	2.9	3.97	1.07 increase	3.57

Construction of Engineered Log Jams (ELJs)

The proposed action includes the construction of 12 ELJs downstream of the existing and new bridge structures as mitigation for riverine impacts resulting from emergency response in 2016 and 2017 to address the scour around bridge footings of the existing bridge. The mitigation was requested by the LEKT of FHWA and WSDOT, consistent with the Tribe's reach restoration planning efforts. The WSDOT Hydrology staff conducted an analysis of the hydrologic response to the placement of ELJs upstream and downstream of the new bridge (WSDOT 2019, Appendix D). The WSDOT analysis focused on ELJ placement above and below the new bridge location. Because the analysis concluded that there is potential shallow bedrock in proximity of the bridge crossing and upstream that posed a risk of ongoing scour to ELJs at these locations, the WSDOT proposes 12 ELJ sites and three additional alternate sites, all downstream of the new bridge crossing.

The WSDOT proposes to construct a mosaic of ELJs to promote an anabranching channel with associated forested islands within the floodplain to 1) maximize channel length, 2) create and sustain as many pools as possible, and 3) create stable alluvial islands for forest to mature to improve shading of the river and provide a long-term source of wood (WSDOT 2019, p. 1). Design plans include 12 proposed ELJ locations and three additional alternate locations that

could be utilized during construction if up to three of the ELJ locations selected needed to be relocated due to subsurface conditions, such as shallow bedrock, that would prevent ELJs from being constructed to design specifications. The WSDOT proposes to complete the ELJ construction during the 2024 IWWW.

The schedule and sequencing for the ELJ construction may change based upon WSDOT preference, the selected contractor's preferred and approved sequencing plan, and river conditions at the time of construction. The general sequence for the installation of the ELJs is proposed as follows:

- 1) Develop temporary access routes and temporary stream crossings (if needed).
- 2) Clear and grub the ELJ excavation footprint outside of the wetted channel.
- 3) Isolate, de-fish, and dewater in-water work area.
- 4) Excavate the riverbed and banks down to the design elevations. Stockpile excavated material outside of the flowing channel for later use as backfill material.
- 5) Install dewater systems to maintain a dry work area in excavated area. Discharge construction water to upland areas for infiltration, or to an alternate system that prevents turbid water from re-entering the stream channel.
- 6) Construct ELJs as per design plans.
- 7) Excavate any additional material needed to create the scour pool per the design plans.
- 8) Remove site isolation measures such that turbidity is controlled consistent with approved water quality permits.
- 9) Rehabilitate the site by removing track marks, decompacting soils, scarifying soil surfaces, and dispersing woody debris and vegetation waste that was cleared during construction to cover disturbed areas.
- 10) Complete restoration planting of ELJs and disturbed areas with native vegetation sourced from the ONP Native Plant Nursery.

Details of temporary access road and temporary bridge construction, dewatering and fish exclusion, and ELJ construction are included in the Appendix E of the BA Supplement (WSDOT 2022) and are incorporated by reference. Project construction is summarized below.

Access Routes

The WSDOT will use the temporary access roads across the floodplain constructed for bridge work under the 2018 Opinion (WSDOT 2022, p. C-9) to gain access to the ELJ sites. Temporary access roads below OHWM will be aligned primarily on dry gravel bars and will minimize impact to existing riparian vegetation and existing wood accumulations. Wetlands and other sensitive areas will be avoided.

Up to two temporary access roads from the east side of the river and at least one temporary bridge will be constructed to access ELJ locations. The longer stream crossing will need to span approximately 150 feet of the main Elwha channel based on its current location with a maximum width of up to 16-feet. Temporary bridge construction will likely involve the temporary placement of concrete ecology blocks, steel decking, and additional timber for framing or decking of the bridge. The contractor will determine the design and materials depending on the equipment travelling over the temporary bridge and the conditions of the river at time of construction; and will determine the span of the bridges based on the discharge, water surface elevations, river position, and equipment needed to cross the river at the time of construction. Additional “minor” stream crossings may be needed for up to three ELJ locations if significant flow is in the side channel at time of construction. Minor crossings are typically constructed with logs as stringers and decked with a steel plate.

Construction of temporary access roads for the ELJ construction will clear 1.29 acres of riparian vegetation (Table 1). Temporary roads will be constructed with native material and no imported material is anticipated for access routes. After the Project is complete, all of these areas associated with temporary access will be replanted.

Dewatering and Fish Removal

ELJ sites are located within the anticipated wetted channel as well as on dry gravel bars and floodplain areas outside of anticipated wetted channels during construction. Given the dynamic nature of the river channel it is uncertain how many of the ELJ sites will be within the wetted channel at the time of construction. As such, it is assumed that all 12 proposed and three alternative ELJ sites (15 ELJ sites total) will require site isolation and fish handling and will impact up to 217,500 ft² (12,700 ft² per ELJ, 15 ELJs maximum, Table 2). The ELJ work areas will be isolated from flowing water with “bulk bags” filled with on-site gravels generated during excavation and the bulk-bags will be placed in the flowing channel as a linear barrier to isolate the work area from flow. During work site isolation, fish will be removed and relocated to areas outside of the work area following the WSDOT 2021 Fish Exclusion Protocol and Standards (WSDOT 2021). ELJ construction will only commence once the river isolation system is established and work areas have been cleared of fish.

Table 2. Revised impact areas for work area isolation, fish removal, and dewatering.

	Area Isolation Dam	Area Behind Isolation Dam	Total Area Impacted	
Bridge construction and removal	Area (ft ²)	Area (ft ²)	Area (ft ²)	Area (acres)
Phase 1	2,600	110,000	112,600	2.58
Phase 2	1,400	30,000	31,400	0.72
Total Bridge Work	4,000	140,000	144,000	3.31
ELJs	27,000	190,500	217,500	4.99
Total Project	31,000	330,500	361,500	8.30

Surface and subsurface water encountered during excavation will be pumped to an upland area for infiltration. For sites located on gravel bars outside of the wetted channel at the time of constriction, water control would be limited to pumping of excavation areas to suitable upland areas for infiltration. The isolation area where fish will be removed for the Project overall will increase from 3.31 acres to 8.30 acres (Table 2).

ELJ Construction Detail

Construction of ELJs will require heavy equipment including but not limited to track excavators, off-road haulers, bull dozers, cranes, log skidders, auger drill rig, log-shovels, log-truck and other smaller equipment working below the OHWM. Operation of equipment below the OHWM will occur only during the approved IWWW.

Construction of the 12 ELJs downstream of the bridge may occur simultaneously with bridge replacement work during the IWWW because the ELJs are outside of the work area for bridge construction. The work site for each ELJ location and accessed by temporary access roads will be approximately two times the ELJ excavation footprint prepared for site work, including excavation and temporary stockpile of materials, clearing, grubbing, leveling and minor grading. Each ELJ location will be restored and stabilized by reconstructing natural wood accumulations in or near their pre-Project location, removing track marks, decompacting soils, and scattering slash and native vegetation debris cleared during site prep. Based on the particular site conditions, existing wood moved from natural logjams or floodplain surfaces to allow construction may be either placed back in its pre-Project condition or placed within constructed ELJs at the direction of the Engineer.

The ELJs proposed are a matrix of large diameter, green, untreated logs and small diameter logs interwoven between vertical members that anchor the ELJ to the river. ELJs will be approximately 100-feet wide and 50-feet long. All log quantities will be finalized during final design. In general, each ELJ will consist of construction components as described in Table 3.

Table 3. Construction Components for ELJ Construction

Item	Quantity	Description
Driven timber piles	192 (16 per ELJ)	Untreated Douglas-fir, 22-inch butt diameter by 40-foot long
Large logs with rootwads	168 (14 per ELJ)	24-inch diameter by 45 to 50-foot long
Large logs without rootwads	108 (9 per ELJ)	24-inch diameter by 40 to 60-foot long
Racking logs	4,800 (400 per ELJ)	6 to 12-inch diameter by 20 to 50-foot long
Slash	8,400 yd ³ (700 yd ³ /ELJ)	Limbs, brush, and twigs

The design calls for two types of ELJs based upon how they will be anchored to the substrate (USFWS 2018, Appendix E, p. 6):

Type 1 ELJ: Type 1 ELJs will be timber-pile supported, which are often easier to construct than excavated post supported ELJs because they require less excavation of the riverbed below the water table and less water pumping and turbidity control. Timber piles are expected to be Douglas-fir with a butt diameter of 18 to 22 inches and embedded between 25 to 30 feet beneath the adjacent thalweg. Piles will be installed via an impact hammer, vibratory hammer, auger, or a combination of these methods, depending on geotechnical information available to contractor.

Type 2 ELJ: Type 2 ELJs an alternative anchoring method to timber pile and will be anchored by timber posts with rootwads. Rootwad post anchors are specified as an alternate anchor method in the event that shallow bedrock is observed and precludes timber pile installation. Posts are installed by excavating a post hole, placing the vertical post, and then backfilling. Posts are specified to be Douglas-fir and 22 to 25 inches diameter at breast height and have a rootwad attached that is three to four times the diameter of the tree bole. Post depths are typically between 15 and 20 feet below the thalweg.

The installation steps for Type 1 (timber pile) and Type 2 (timber posts with rootwads) vertical supports are as follows:

- Complete work site isolation and fish removal.
- Excavate a roughly 10-foot deep pit with roughly 1:1 side slopes beneath the adjacent thalweg using a tracked excavator and shored for safety as necessary.
- Stockpile excavated alluvium next to the pit to use as backfill after construction of timber structure.
- Dewater pits with pumps as necessary to allow for placement and inspection of timber pile and logs, or rootwad posts. Maintain excavation pit in the dry condition until construction of ELJ is complete.
- Drive timber piles to a minimum depth of approximately 25 -feet below the thalweg using a tracked excavator or crane equipped with an impact or vibratory hammer. Drilling or auguring of piles is an acceptable method for pile installation but is less common for this application.
- Should shallow bedrock preclude installation of timber piles, install rootwad in lieu of timber piles as vertical supports, as specified by the engineer.
- Once vertical support (timber pile or rootwad post) are in place, a tracked log loader and/or excavator with hydraulic thumb and a tracked excavator with hydraulic thumb will be used to then place the logs and then slash between the timber piles or rootwad posts.

Details of the location and configuration of the ELJ construction is included in drawings contained within the Supplemental BA Appendix E (WSDOT 2022) and is incorporated by reference.

Excavation of Benthic Habitat for ELJ Construction

The final determination for ELJ locations will be based in the field at the time of construction based on the location of bedrock relative to river alluvium sediment depth (i.e., deeper alluvium improves ability to anchor the ELJ). However, riverbed conditions continue to change with increase flows and sediment loads annually. If subsurface conditions are encountered during ELJ construction that precludes proper anchoring of the ELJ, then the engineer will direct the construction to an alternate site. The disturbed area will be restored to prior condition to the extent possible.

The contractor will excavate approximately 152,400 ft² of benthic habitat to construct 12 ELJs with scour pools. However, it is possible that up to 190,500 ft² will be excavated to account for three alternative ELJ sites should any of the original twelve sites have subsurface conditions that limit ability to achieve design criteria for ELJ stability. Any site that proves unbuildable at the time of construction (up to 38,100 ft²) will be backfilled to existing grade (Table 4).

Table 4. Area of Excavation for Construction of ELJs

Excavated Area	Area (ft ²) Per ELJ	Area (ft ²) 12 ELJ sites	Area (ft ²) 15 ELJ sites
ELJ footprint	4,500	54,000	67,500
Pool habitat	2,400	28,800	36,000
Temporary work area outside of ELJ and pool area – backfilled with native alluvium material	5,800	69,600	87,000
Total	12,700	152,400	190,500

The Project as modified will permanently convert 82,800 ft² of benthic habitat excavated to ELJ habitat with scour pools at 12 ELJ sites (54,000 ft² ELJ footprint plus 28,800 ft² pool footprint, Table 4). ELJ construction is expected to require up to 14 days for the first ELJ and up to seven days per ELJ following. Some ELJs may be constructed simultaneously, but number and sequencing is at the discretion of the contractor, and site specific conditions. It is expected that up to half of the riverbed will be in the dry during construction,

The bridge replacement work is expected to result in 8.6 acres of temporary benthic impacts during two IWWs (USFWS 2018). The installation of ELJs is anticipated to result in an additional 5.0 acres of benthic impacts (FHWA 2017, p. 7) for a total of 13.5 acres of temporary benthic impacts (Table 5).

Table 5. Benthic impact areas for bridge replacement work.

Activity	Bridge Work	ELJ Construction	Total Project
Temporary Access pads (below OHWM)	29,500 ft ²	NA	29,500
Work Area Isolation / Fish Exclusion	144,000 ft ²	217,500 ft ²	361,500 ft ²
(Isolation dam footprint)	(4,000 ft ²)	(27,000 ft ²)	
(Area isolated behind dam)	(140,000 ft ²)	(190,500ft ²)	
Increased scour during construction	93,000 ft ²	NA	93,000 ft ²
Increased Depositional area during construction	106,000 ft ²	NA	106,000 ft ²
Total Benthic Area Impacted	372,500 ft ² (8.6 acres)	217,500 ft ² (5.0 acre)	590,000 ft ² (13.6 acres)

Summary of ELJ Construction Impacts

Project impacts from the construction of ELJs are summarized in Table 6 below.

Table 6. Summary of Impacts from ELJ Construction.

Item	Quantity	Description
Work site isolation and fish exclusion from channel	Up to 217,500 ft ² (15 ELJ sites)	Includes 27,000 ft ² isolation dams and up to 190,500 ft ² area behind dam
Area streambed excavation for ELJ construction	Up to 190,500 ft ²	Approximately 12,700 ft ² per ELJ (15 ELJs max)
Volume streambed excavation for ELJ construction	Up to 70,500 yd ³	Approximately 4,700 yd ³ per ELJ (15 ELJs max)
Length of temporary access roads	3,500 linear feet	
Area of temporary access roads	56,000 ft ²	Assume 16 ft-wide; no import of materials
Area of temporary overwater bridges	3,700 ft ²	Shading over water only during IWWW. Temporary bridge will not remain over winter.
Volume temporary fill for temporary bridges	22 ft ³	Includes ecology block or similar concrete footings
Area of temporary fill for temporary bridges	300 ft ²	Includes ecology block or similar concrete footings
Area of temporary fill for isolation dams	27,000 ft ²	Cofferdam and on-site sourced alluvium
Volume of temporary fill for isolation dams	4,500 yd ³	Cofferdam and on-site sourced alluvium

Updated Stormwater Treatment

There is currently no stormwater treatment from PGIS within the Project limits. The 2018 Opinion described proposed stormwater treatment as including primarily bioinfiltration best management practices (BMPs) including vegetated filter strips, biofiltration swales, media filter

drains, or bioswales. The Project modifications will increase the amount of new and replaced PGIS by 1.35 acres (from 3.27 acres to 4.62 acres). Stormwater from 2.36 acres new and replaced PGIS for the Project, as modified, will receive enhanced stormwater treatment (51 percent), including the installation of additional media filter drains. Approximately 1.78 acres within the Project limits will continue to have no stormwater treatment (Table 7).

Table 7. Stormwater Treatment

	2018 Opinion	Supplemental BA
New PGIS	2.07 acres	2.07 acres
Total new and replaced	3.27 acres	4.62 acres
New and Replaced PGIS receiving treatment	1.49 acres (enhanced)	2.36 acres (enhanced)
New and Existing PGIS not receiving treatment	1.78 acres	1.78 acres

Summary of Project Modifications

The Project revisions include the following:

- Delay in Project construction by four years.
- Increase of riparian impacts from 2.9 acres to 3.97 acres (net increase 1.07 acres).
- Restoration of riparian acres from 2.20 acres to 3.57 acres.
- Addition of 12 ELJs constructed below OHWM as mitigation for instream impacts from bridge construction and prior emergency response actions.
- Increase of temporary and permanent benthic impacts from 8.6 acres to 13.6 acres (net increase 5.0 acres).
- Addition of 3,700 ft² of temporary overwater shading from use of temporary bridges for the duration of two in-water work windows.
- Increase area of work area isolation, dewatering, and fish handling from 3.31 acres to 8.30 acres (net increase of 4.99 acres).
- Increase in linear extent of sedimentation and turbidity from approximately 3,700 linear feet to approximately 5,000 linear feet of wetted channel over two in-water work windows (net increase 1,300 linear feet).
- Increase area of new and replaced PGIS to receive stormwater treatment from 1.49 acres to 2.36 acres (net increase of 0.87 acre).

Conservation Measures

Conservation measures described in the prior consultation (USFWS 2018, p. 17-19) include WSDOT's standard conservation measures as described in the US 101 Elwha Bridge Replacement Project BA (WSDOT 2017, p. 24 – 28), USFWS Programmatic Biological Opinion for WSDOT Projects in Washington State (USFWS 2015, p. 120 – 140), WSDOT's Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT 2016, entire) and WSDOT's Roadside Policy Manual (WSDOT 2015, entire), and are incorporated by reference. Minimization measures described in the original consultation will be implemented for all future construction. Many of the impact avoidance and minimization measures were developed by FHWA and WSDOT in consultation with the LEKT prior to completing consultation with USFWS and National Marine Fisheries Service in the prior submittal.

Water Quality Monitoring

Water quality monitoring for suspended sediment and turbidity were described in the 2018 Opinion (USFWS 2018, p. 39-41), consistent with State water quality permits, and included a compliance distance of 1,500 feet downstream of from Project activities. The Project modifications extends the water quality compliance distance for turbidity to 1,800 feet below the furthest downstream instream work.

Intensive and routine monitoring will be utilized throughout construction below OHWM or above the Elwha River in order to document and ensure that water quality compliance is maintained through the life of the project. The WSDOT will monitor turbidity to determine the amount of suspended sediment present in a water sample during in-water work. Turbidity is measured in nephelometric turbidity units (NTUs).

The WSDOT proposes the following water quality monitoring protocols:

- Background samples in the Elwha River will be taken prior to the start of construction activities each day (assuming standing water is present).
- Background NTU levels will be collected 100 feet upstream of any in-water work.
- Water quality samples will be collected 1,800 feet downstream from the farthest downstream work activity.
- Monitor at 2-hour intervals beginning one hour after start of work. If there is no non-compliance after three days shift to monitoring every four hours or if there is visible turbidity increase.
- Turbidity shall not exceed 5 NTU over background when background NTU level is 50 NTU or less; turbidity shall not exceed a 20 percent increase in turbidity when background level is greater than 50 NTU.

- The WSDOT shall have qualified environmental compliance staff conduct continuous visual monitoring at in-water work areas or at point of compliance. If turbidity is visible a sample will be collected and tested. If the sample does not meet the State water quality standard, the contractor will stop work immediately and will only be allowed to start work when water quality is back in compliance.

In addition, the FHWA/WSDOT shall have qualified environmental compliance staff conduct visual inspections of BMPs within the project work extents daily within the work week to ensure BMPs are installed correctly and functioning as intended.

Action Area with Modified Aquatic Zone of Effect

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment.

The Project as modified, adding the construction of ELJs downstream of the existing bridge, will not modify the terrestrial extent of the action area, delineated by the furthest extent of construction noise (approximately 2.6 miles /13,771 feet) from Project activity, Figure 1).

The aquatic extent of the action area is a smaller area encompassed within the action area (Figure 2). The aquatic extent of the action area described in the 2018 Opinion included 3,700-foot stretch of the Elwha River that encompassed a combined area of 2,400 feet downstream of the existing bridge from the expected extent of turbidity and 1,300 feet upstream of the existing bridge from expected extent of backwatering by the river diversion and cofferdams (USFWS 2018, pp. 19 – 20).

Although the Project as modified will not change the terrestrial extent of action area (2.6 miles) they will increase the aquatic zone of the action area. The aquatic zone of the action area has been modified to include reach of the river subject to ongoing dynamic changes from the installation of ELJs and temporary construction turbidity from demolishing the existing bridge and installing the ELJs.

The Project as modified to include the ELJ construction will produce episodic pulses of turbidity that will occur 1,300 linear feet upstream of the existing bridge (backwatering from bridge replacement work) and another 3,688 linear feet downstream of the existing bridge, including the extent of turbidity 1,800 linear feet downstream of the furthest downstream ELJ. Thus, demolishing the bridge and the furthest downstream ELJ will create temporary turbidity spanning the entire wetted width of the river for approximately 4,988 linear feet of the Elwha River over two in-water work windows (approximately 46 days in 2023 and up to 76 days in for a total of 122 days) as depicted in Figure 2.

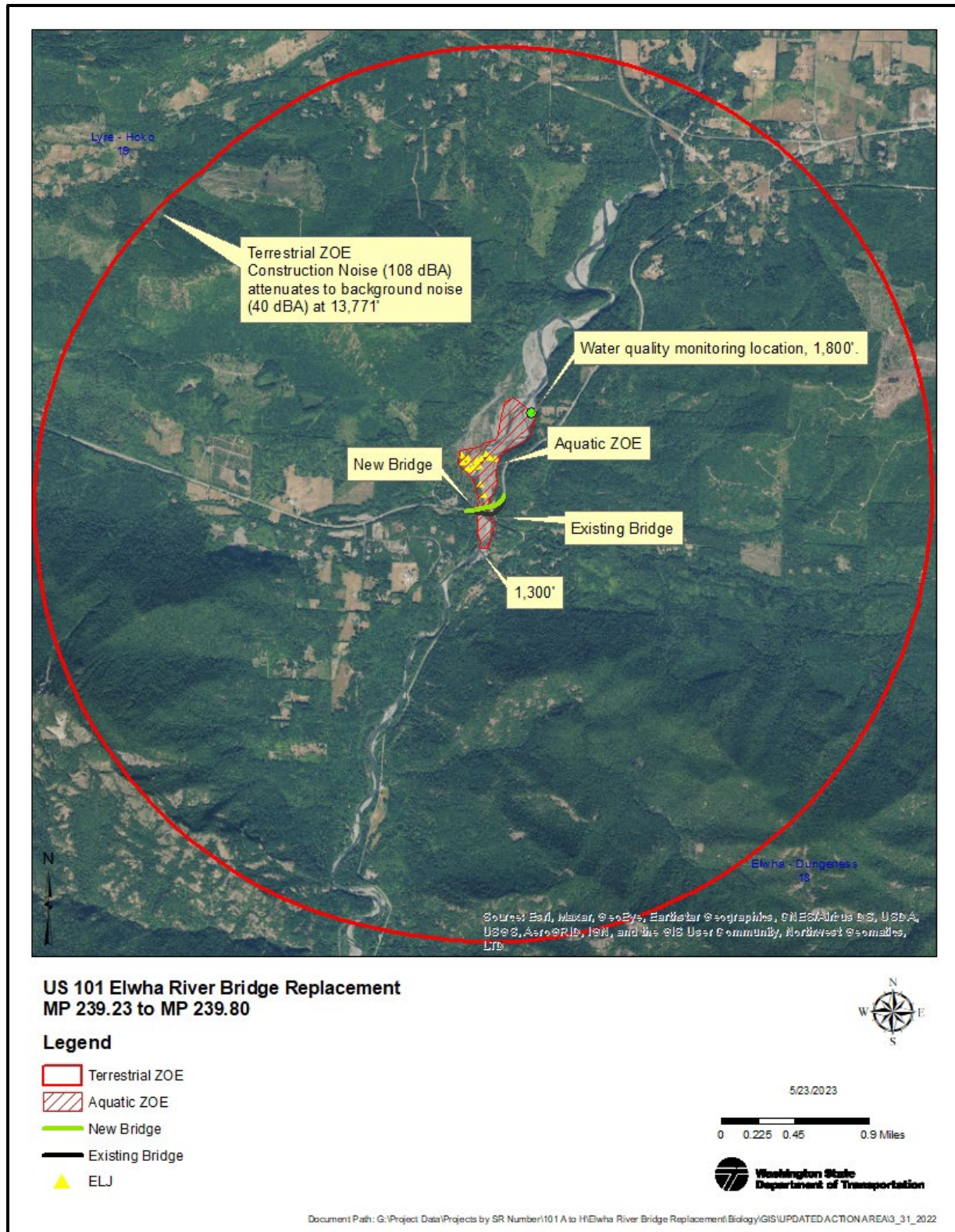


Figure 1. Project Action Area (Molenaar, in litt. 2023b).

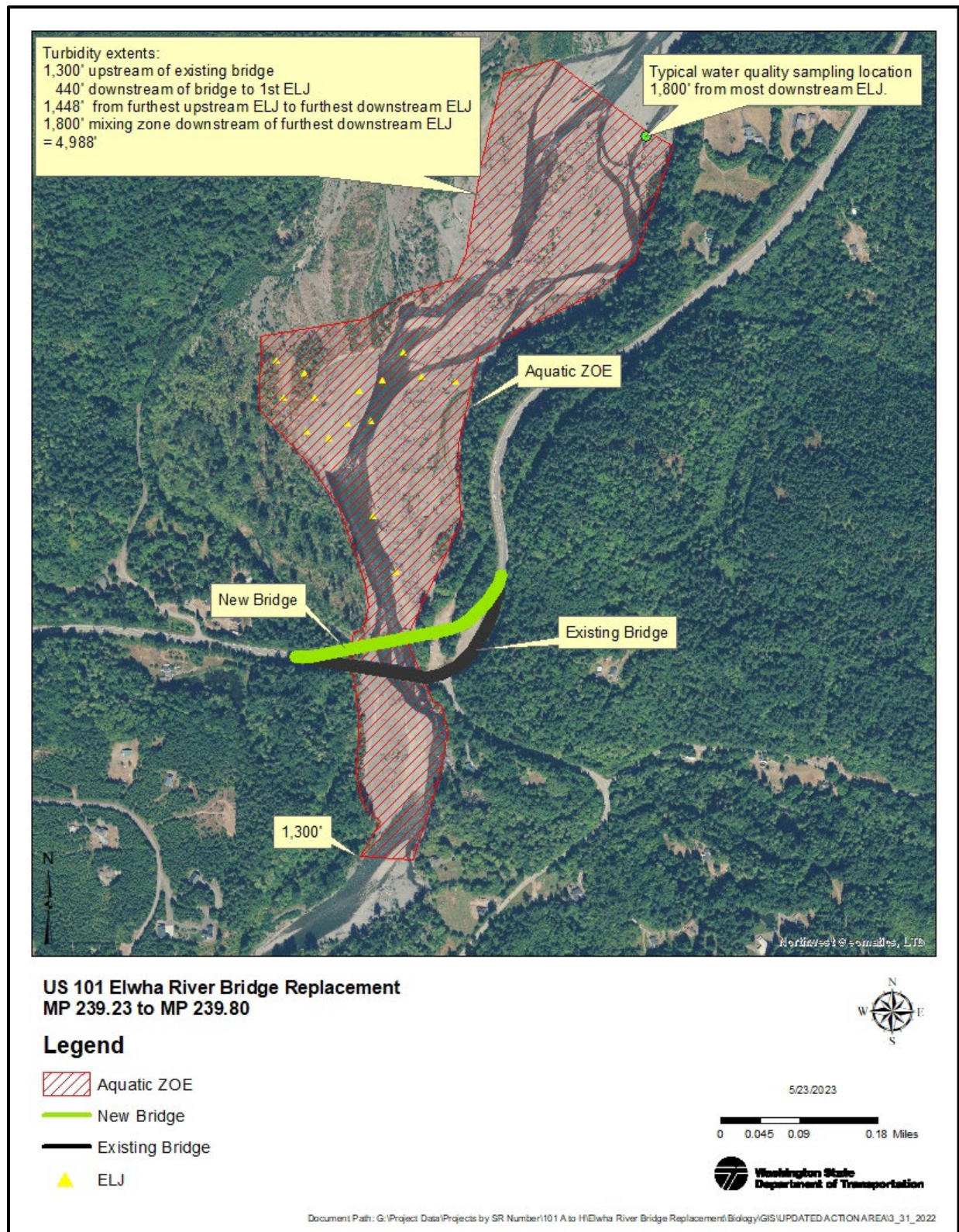


Figure 2. Extent of episodic periods of turbidity for bridge replacement work and ELJ construction over two in-water work windows (July 15 to August 30), in 2023 and 2024 (Molenaar, in litt. 2023b).

STATUS OF BULL TROUT AND DESIGNATED BULL TROUT CRITICAL HABITAT

The status of bull trout and bull trout critical habitat is described in the 2018 Opinion and is incorporated by reference (USFWS 2018, pp. 21 – 35).

ENVIRONMENTAL BASELINE OF BULL TROUT AND DESIGNATED BULL TROUT CRITICAL HABITAT

The current condition of bull trout and bull trout critical habitat in the action area is summarized below.

The Elwha River core area is one of two core areas on the Olympic Peninsula that drain to the Strait of Juan de Fuca. Upon the removal of the Elwha River Dams, bull trout were an early and rapid recolonizer and displayed migrations throughout the reconnected river and its estuary (Brenkman et al. 2019, p. 560). Anadromous, fluvial, and resident bull trout life-history forms are all present within the Elwha River. Bull trout use the action area primarily for foraging and migration. Spawning and rearing occur in the upper watershed. Spawning has also recently been documented in the lower reaches of the Little River. Adult upstream migration occurs in the fall (September to November), with peak spawning in late October. Most individuals in the action area would be adult or subadult fish, but some juveniles could be present. Juvenile, subadult, and non-spawning adult bull trout could occur in low densities in the action area throughout the year (Geffre et al. 2016, USFWS 2018, p. 26).

In the action area, all portions of the Elwha River, the Little River, and Indian Creek are designated bull trout critical habitat in the Olympic Peninsula Critical Habitat Unit. The aquatic extent of the action area (approximately 5,000 linear feet of the Elwha River, 600 linear feet of lower Indian Creek, and 200 linear feet of lower Little River) provides suitable foraging, migration, and overwintering habitat. The quality and distribution of those habitat types are expected to be quite variable as the channel continues to stabilize after dam removal. Geomorphic alterations of the channel and changing bed-sediment grain size are likely to continue to affect aquatic habitat structure, benthic fauna, salmonid spawning and rearing potential, and riparian vegetation (East et al. 2015).

The 2018 Opinion analyzed the effects of the Project on the primary constituent elements (PCEs) of bull trout critical habitat. The Project modifications (addition of ELJs) will result in the same impacts to PCEs but to a greater extent and will be discussed below.

Climate Change

The 2018 Opinion analysis of Project effects included consideration of ongoing and projected changes in climate and this information is incorporate by reference (USFWS 2018, p. 34 – 35). The Project as modified to include the ELJs is expected to not be affected any differently by climate change.

EFFECTS OF THE ACTION: BULL TROUT

The effects of the action on bull trout remain largely unchanged from the effects described in the 2018 Opinion (USFWS 2018, pp. 35 – 49), and the description of these effects is incorporated by reference. The Project as modified includes the construction of ELJs with additional heavy equipment operation below the OHWM and additional area of dewatering and fish exclusion from the work area. The proposed action will result in temporary hydraulic changes through the work area during bridge replacement work, and during the construction of the ELJs and beyond. Therefore, the proposed action will result in both direct and indirect effects on bull trout and designated bull trout critical habitat.

Insignificant and Discountable Effects

In our 2018 Opinion (USFWS 2018, pp. 36 – 37) we determined that the Project, as proposed, with implementation of the proposed conservation measures and permanent design elements, would result in the following potential effects to bull trout that would be extremely unlikely to occur (discountable) or will not be measurable or detectable (insignificant):

- Effects to bull trout from stormwater runoff; and
- Effects to bull trout from elevated levels of underwater sound.

These effects remain unchanged in the current analysis and therefore will not be addressed further.

Shading

The 2018 Opinion did not analyze shading in the context of overwater structure, only shade related to loss of riparian vegetation. Shading impacts from overwater structures will result in a total increase of 3,700 ft² from the use of temporary bridges for construction access. The duration of temporary shading is expected to last through the IWWW for each respective construction season. The temporary bridges will not remain in place over the winter.

Overwater structures, such as the temporary bridge, cast shade that can create sharp underwater light contrasts during daylight. Adult, sub-adult and juvenile bull trout need light to navigate and orient themselves, capture prey, and avoid predators. Altering juvenile navigation abilities and forcing prey (juvenile salmon and steelhead) into the margins of the stream will reduce foraging opportunities of sub-adult and adult bull trout.

However, due to the impermanence of the temporary bridges (approximately 46 days during 2023 IWWW and up to 76 days in 2024 IWWW) and the limited extent of the overwater shading (3,700 ft²), the temporary habitat impacts associated with these structures are not expected to measurably affect prey resources in the Elwha River as a whole. Similarly, the shade from the bridges will not measurably alter the migratory, foraging, and overwintering functions the habitat in the action area currently provides for the bull trout. In summary, effects to bull trout from shade-related prey resource impacts are considered insignificant.

Adverse Effects to Bull Trout

The aquatic extent of the action area provides suitable foraging, migration, and overwintering habitat. The quality and distribution of those habitat types are expected to be quite variable as the channel continues to stabilize after dam removal. Geomorphic alterations of the channel and changing bed-sediment grain size are likely to continue to affect aquatic habitat structure, benthic fauna, salmonid spawning and rearing potential, and riparian vegetation (East et al. 2015, p. 765).

In our 2018 Opinion, we described adverse effects to bull trout from Project activities from the following activities (USFWS 2018, pp. 38 - 43) and this analysis is incorporated by reference:

- Impacts on benthic habitat;
- Exposure to elevated levels of suspended sediment and turbidity;
- Fish handling and stranding during dewatering of work area;
- Impeded migration from increased water velocity; and
- Removal of riparian vegetation.

The above effects described in the 2018 Opinion will be temporary and will persist only during and shortly after construction. Construction activities have the potential to kill or injure a limited number of juvenile, subadult, or adult bull trout and to significantly disrupt their normal behaviors. Seasonal timing of in-water work and implementation of other BMPs will minimize impacts on individual fish. Indirect effects on bull trout habitat may last for several months after construction as the disturbed streambed adjusts to the new conditions.

The Project as modified to include the addition of ELJ construction will increase the impacts to bull trout from benthic disturbance, elevated levels of suspended sediments and turbidity, fish handling, and riparian vegetation removal as described below.

Benthic Impacts

The 2018 Opinion described the expected benthic disturbance over an area equal to approximately 8.6 acres for previous emergency actions and activities associated with bridge replacement work. The Project as modified will add approximately 5.0 acres of additional benthic habitat disturbance through work area isolation and dewatering and excavation for the ELJs, impacting up to a total of 13.6 acres of benthic habitat (Table 5).

Conversion of the bed and benthos on and immediately around the ELJs locations is likely to significantly alter forage for juvenile bull trout and bull trout prey for sub-adult and adult bull trout by temporarily reducing prey availability in the immediate vicinity of the ELJs. The remaining riverbed alluvium, benthic habitat, excavated in the dry, is considered an indirect impact through the associated backfill and regrading of alt ELJ sites and the potential release of

sediment and turbidity activated later by winter storms in the floodplain following Project completion. The location of the cofferdams will also temporarily alter migratory pathways and alter sediment size and distribution within the action area.

We expect that temporary benthic impacts and impacts to salmonid spawning will adversely effect bull trout and their prey base by temporarily reducing foraging efficiency and availability of food resources to an extent that could have a measurable, sublethal effect on fitness (i.e., injury). We estimate this adverse effect will permanently impact up to 152,400 ft² benthic habitat in the vicinity of the final 12 locations (Table 4).

Exposure to elevated levels of turbidity and suspended sediments

As described in the Action Area section above, we now expect the extent of suspended sediment and turbidity to increase overall for the Project with the addition of the ELJ construction. The Elwha River channels frequently change their course and size, especially during winter and spring floods. Because of the dynamic nature of the river branching across the floodplain, the lateral extent and area of impact is difficult to calculate over the two IWWs. However, we expect temporary turbidity effects for the Project as a whole to span the entire wetted width of the channel and encompass approximately 4,998 linear feet of the Elwha River. This extent will include 1,300 linear feet upstream of the existing bridge (backwatering from bridge replacement work) and another 3,688 linear feet downstream of the existing bridge, including the extent of turbidity 1,800 linear feet downstream of the furthest downstream ELJ. Although in-water construction activities are expected to result in only localized and intermittent levels of elevated turbidity, we conservatively assume that suspended sediment equal to extent of the effect (approximately 5,000 linear feet of the Elwha River) will occur each day, seven days a week, for the duration of the IWWs in 2023 and 2024 (approximately 46 days in 2023 and 76 days in 2024 for a total of 122 days). Our assumption anticipates that the timing and duration of construction activities will be difficult to predict.

The 2018 Opinion analysis of effects included a description of the methodology by which we measured effects of suspended sediment in excess of natural amounts on bull trout and their habitat (Muck 2010, entire; USFWS 2018, Appendix C) and is incorporated by reference. That analysis assessed the suspended sediment concentrations at which adverse effects to bull trout will occur.

Consistent with the approach in the 2018 Opinion and including the modified areas of impact from the ELJ construction, we expect that adverse effects on adult, subadult, and juvenile bull trout are likely to occur under the following circumstances.

- 1) When background NTU levels are exceeded by 105 NTU at any time.
- 2) When background NTU levels are exceeded by 70 NTU for more than 1 hour, continuously.
- 3) When background NTU levels are exceeded by 28 NTU for more than 3 hours, cumulatively, over a 10-hour workday.

- 4) When background NTU levels are exceeded by 13 NTU for more than 7 hours, cumulatively, over a 10-hour workday.

To ensure turbidity levels do not exceed the above described levels throughout the life of the project, the WSDOT has proposed the following monitoring protocols:

- Intensive and routine monitoring will be utilized throughout construction below OHWM or above the Elwha River in order to document and ensure that water quality compliance is maintained through the life of the project.
- Turbidity shall not exceed 5 NTU over background when background NTU level is 50 NTU or less;
- Turbidity shall not exceed a 20 percent increase in turbidity when background level is greater than 50 NTU.
- Water quality monitoring will occur at regular intervals within the compliance distance of 1,800 feet as described prior (see Water Quality Monitoring under Conservation Measures).

We expect compliance with these water quality monitoring parameters will enable WSDOT to manage turbidity such that turbidity levels above background (described above and in the 2018 Opinion) that result in adverse effects to bull trout will not occur outside the turbidity mixing zone.

Based on this information, we expect that suspended sediment concentrations resulting in adverse effects on bull trout are reasonably certain over the aquatic extent of the action area (Figure 2) and encompass the approximately 5,000-foot-long reach of the Elwha River during the two consecutive IWWWs as described above.

Juvenile, adult, and subadult bull trout may occupy the waters immediately surrounding the area where in-water work will occur (Project area) at any time of year. Adult and subadult bull trout are less likely to be affected by episodic increases in turbidity during construction but may exhibit a behavioral response (likely temporary avoidance of turbid areas). Juvenile bull trout exposed to elevated turbidity and suspended sediments could experience reduced foraging efficiency and higher energetic expenditures as they are forced to avoid turbid areas.

We expect that exposure to temporary elevated turbidity and suspended sediments will have an adverse effect on adult, subadult, and juvenile bull trout to an extent that will have a measurable effect on fitness. Resulting turbidities may also impede or discourage free movement through the action area, delaying or discouraging adult bull trout from migrating through and around the Project area. Bull trout will not be exposed to elevated turbidities outside daylight hours; therefore, nocturnal movements and migration through and around the Project area will be unimpeded during certain times of the day. Given the short duration of turbidity-generating activities, the effects of turbidity are minimized but likely to result in increased predation, decreased feeding, injury, or death.

In-water work will only occur from approximately July 15 to August 30 in 2023 and June 15 to August 30 in 2024 which will limit the duration of turbidity effects and exposure of salmonids to them. The exact beginning and ending dates may vary depending on constructability issues, sufficient justification, and written approval from USFWS.

Fish handling and stranding during dewatering of the work area

The proposed action as modified will increase the area below the OHWM subject to isolation and dewatering from approximately 3.1 acres to approximately 8.3 acres (an increase of approximately 5.0 acres) in order to excavate the riverbed sediments for the construction of the ELJs (Table 2). Any fish in the aquatic work area prior to and during dewatering, and after the completion of the cofferdam, will be captured and removed using approved WSDOT fish handling and exclusion protocols or by appropriately adapted and approved methods (WSDOT 2021).

Fish trapping, handling, and transport are reasonably certain to harm some bull trout, disrupt their normal behavior, and cause short-term stress, fatigue, injury, and, possibly, mortality as described in the 2018 Opinion. Based on the size of the river and fish distribution studies conducted after the dams were removed, we estimated that work area isolation and fish removal as part of the bridge replacement work would result in as many as five bull trout would be subject to capture and relocation, and that one of those captured would be injured or killed. Direct mortality associated with stranding or crushing is limited to an unknown, but a very low number of juvenile bull trout associated with habitat along the channel margins within the action area.

Given the area impacted by dewatering will more than double from 3.1 acres to 8.3 acres (144 percent increase), we expect a commensurate number of additional bull trout to be encountered during dewatering activities. Therefore, we expect the increase of area impacted by dewatering and fish handling for the Project will result in as many as 12 bull trout subject to capture and relocation, two of which may be injured or killed.

Impeded migration from increased water velocity

As described in the 2018 Opinion, temporary in-channel features associated with the bridge replacement work may create localized increases in stream velocities. Increased flow velocities would occur during lower flow conditions while the construction access pads and demolition pads are in the river and while cofferdams are installed for demolition of the existing bridge. To alleviate potential velocity and scour effects between the construction access pads, the WSDOT proposes to remove a portion of each pad on the waterward side of the new piers in between the in-water work windows. During the second phase of bridge demolition, WSDOT contractors will deepen the channel in an area approximately 600 feet long and 80 feet wide to reduce stream velocities while the work area is isolated.

The Project as modified will further contribute to localized increased flow velocities temporarily while the ELJs are under construction that will extend over approximately 1,848 linear feet of channel from the existing bridge work area downstream to the location of the furthest

downstream ELJ (Figure 2) during two consecutive IWWs. However, we expect once ELJ construction is complete and the channel re-engages with flows that the ELJs will provide cover and deep quiescent pools for bull trout within the river channel.

Bull trout forage in and migrate through the action area to reach headwater streams in the middle and upper Elwha River. Upstream migration occurs primarily from early summer to late fall, which overlaps the in-water work window (June 15 to August 30). Increased water velocities during construction during lower flow levels could temporarily delay upstream migration, but some spawning adults may attempt to migrate through the construction area if water flows are sufficient. We expect adult bull trout holding in pool habitat below the instream work that are awaiting stream flows to increase in the fall will move to more favorable habitat to avoid prolonged exposure to elevated suspended sediment. Any exposure durations are likely to be limited due to the ephemeral nature of the turbidity plume, adherence to the in-water construction period to minimize likelihood of bull trout presence, and the use of water quality BMPs to limit elevated turbidity events. However, delays in spawning migration and associated energy expenditure may reduce fitness of individual spawning adults and subsequent spawning success for a small number of affected bull trout for up to two spawning seasons.

Removal of riparian vegetation

We identified the removal of riparian vegetation associated with the bridge replacement work as an adverse effect to bull trout in the 2018 Opinion by analyzing the effects of riparian removal as an adverse effect to PCE 4 (USFWS 2018, p. 44 – 45). This analysis is incorporated by reference.

The Project as modified increased the area of riparian removal for the Project overall from 2.9 acres to 3.97 acres (net increase 1.07 acres, Table 1). In temporarily cleared areas (3.57 acres), impacts will last for several decades until planted trees have matured. Impacts will be permanent in the portion of the riparian buffer zone converted to new roadway (0.4 acre). See Effects on the PCEs of Designated Bull Trout Critical Habitat section for description of effects to PCE 4 from removal of riparian vegetation.

EFFECTS ON THE PCES OF DESIGNATED BULL TROUT CRITICAL HABITAT

The 2018 Opinion described the effects of action on the primary constituent elements (PCEs) and this analysis is incorporated by reference (USFWS 2018, pp. 43 – 46). The proposed action as modified to add the construction of the ELJs will have construction-related effects to the PCEs of bull trout critical habitat as described below:

PCE 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

The proposed action as modified will have no measurable effect on this PCE, consistent with the 2018 Opinion. Any temporary or permanent effect to this PCE will be insignificant. Within the action area, this PCE will retain its current level of function (not impaired).

PCE 2: Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

The proposed action as modified will have measurable adverse effects on this PCE, consistent with the 2018 Opinion. Construction activities will temporarily impair the function of the migratory corridor for two years during the course of in-water work. The temporary work access pads and cofferdams used to isolate the work areas for bridge replacement work and ELJ construction will constrict flows through the work area, creating higher stream velocities and blocking off portions of the channel. Water quality will be degraded during in-water work, potentially impeding bull trout migration through the aquatic portion of the action area. Such effects will be temporary, and the function of this PCE is expected to be restored once in-water work is complete.

PCE 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

The proposed action as modified will have temporary measurable adverse effects on benthic habitats and salmonid spawning areas, consistent with the 2018 Opinion. The Elwha River in the action area provides suitable spawning habitat for Chinook salmon and steelhead, both of which are bull trout prey species. The installation and removal of the construction access pads for bridge replacement work and the construction of ELJs is likely to reduce fish abundance in the action area for the duration of construction (two in-water work windows). Placement and removal of fill in the river, as well as elevated levels of suspended sediment, will also reduce levels of aquatic macroinvertebrates in the action area. The function of this PCE is expected to be restored on timelines as follows. Substrates will return to pre-Project conditions during high flows in the first winter after construction, and fish abundance in the action area is expected to recover one year after construction is complete. Macroinvertebrates will recolonize disturbed areas within two weeks to two months following construction.

PCE 4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.

The proposed action as modified will have significant, unavoidable, long-term impacts on riparian buffers associated with clearing and grading in the riparian area, consistent with the 2018 Opinion. The proposed action as modified will remove approximately four acres of riparian vegetation within 200 feet of the Elwha River or Indian Creek during construction. Removal of riparian vegetation can adversely affect bull trout and their prey species by degrading streambank conditions, leading to degradation of aquatic habitat condition (erosion leading to sedimentation and turbidity, decreasing organic inputs, and LWD recruitment). These impacts are described in the prior Opinion and are incorporated by reference (USFWS 2018, p. 44).

Although approximately 3.57 acres of the 3.97 acres of removed riparian vegetation will be restored using materials obtained from the ONP Native Plant Nursery, the temporal effects of removing mature riparian trees will last for several decades until planted trees have matured. Impacts will be permanent in the portion of the riparian buffer zone converted to new roadway (0.4 acre).

PCE 5: Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.

The proposed action as modified will have no measurable effect on this PCE, consistent with the 2018 Opinion. The area of riparian vegetation removal is too small to affect this PCE. Any temporary or permanent effect on this PCE will be insignificant. Within the action area, this PCE will retain its current level of function (i.e., not impaired).

PCE 6: Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 inch) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.

The proposed action as modified will have no measurable effect on this PCE, consistent with the 2018 Opinion. Suitable bull trout spawning habitats are not present in the aquatic zone of effect of the project action area, and, therefore, the proposed action will have no effect on bull trout spawning habitats. The nearest documented bull trout spawning habitat is in the Little River, just upstream of the existing bridge. The proposed action will have no measurable temporary or permanent effect on this PCE. Within the action area, this PCE will retain its current level of function (i.e., functioning).

PCE 7: A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.

The proposed action as modified will have measurable short-term adverse effects on this PCE, consistent with the 2018 Opinion. The upstream bridge replacement work includes constricting the channel with cofferdams during removal of the old bridge that are expected to result in increased flow velocities during the time of year when in-water construction activities are occurring. The addition of ELJ construction downstream of the bridge replacement work will likewise temporarily contribute to areas of increased stream velocities within the reach. Increased velocities would occur for 14 months while the construction access pads and cofferdams are in the river and during ELJ construction. The effects of changes in flow velocities could extend from the bridge replacement work area downstream to the lower end of ELJ construction (approximately 3,700 linear feet of the river). To alleviate potential velocity and scour effects, a portion of each access pad on the waterward side of the new piers will be

removed during the time of year when no in-water work is being done. During the second phase of bridge demolition, contractors will deepen the channel to reduce stream velocities while the work area is isolated.

PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

The proposed action as modified will have measurable adverse effects on this PCE, consistent with the 2018 Opinion. Temporary, construction-related increases in turbidity will occur within approximately 5,000 linear feet of the Elwha River as a result of Project activities during two in-water work windows. We expect that measurable, construction-related increases in turbidity will be short-term and episodic. We expect that the channel will adjust and resume natural patterns of bedload and sediment transport within two years following construction.

Stormwater treatment for the new bridge will result in a slight improvement of water quality in the Project area over current conditions. The proposed action will have no measurable, permanent, or long-term effects on this PCE. The proposed action will not permanently degrade or impair water quality or quantity within the action area and the PCE will retain its current level of function (i.e., not impaired).

Summary of Effects to PCEs

Consistent with the 2018 Opinion, we expect adverse effects to PCE 2, 3, 4, and 8 which temporarily degrade their condition. However, we anticipate that each of the PCEs will still be able to serve their intended conservation role for the bull trout at the scale of the action area, core area, the critical habitat unit, and rangewide because anticipated impacts are temporary and/or represent an insignificant portion of bull trout habitat at these large scales.

Beneficial Effects

The Project as modified will result in some long-term beneficial effects to bull trout critical habitat. The mitigation work planned to create a mosaic of 12 ELJs within the floodplain of the Elwha River should function to provide a range of channel depths, scour holes, complex cover and resting and refuge habitat from stream velocities and forces. Over the long-term the ELJs are expected to result in more stable alluvial islands for forests to mature and subsequently improve shading of the river and provide a source of large wood. The use of large wood and bio-engineering features in the design are expected to provide some improved foraging and overwintering opportunities for bull trout.

Other Consequences of the Proposed Action

Effects of the action that may occur later in time and that may include consequences occurring outside the immediate area involved in the action were previously described in the 2018 Opinion (USFWS 2018, pp. 46 – 48). The future effects of the project as modified remain consistent with those described in the 2018 Opinion and are incorporated by reference (USFWS 2018, pp. 46 – 48).

CUMULATIVE EFFECTS

Cumulative effects of the action were previously described in the 2018 Opinion. The cumulative effects of the project as modified remain consistent with those described in the 2018 Opinion and are incorporated by reference (USFWS 2018, p. 49).

INTEGRATION AND SYNTHESIS OF EFFECTS

Most of the jeopardy analysis in the 2018 Opinion remains accurate (USFWS 2018, pp. 49 – 52). In this reinitiation of consultation, we analyze the additional quantities of the adverse effects including increased impacts on benthic habitat, increased area of exposure to turbidity, additional fish handling impacts, additional areas subject to temporary increase water velocity impacting fish migration, and additional area of riparian vegetation removal. We also considered long-term benefits to fish from improving in-stream habitat and habitat-forming processes with the installation of the ELJs, added to the Project to offset adverse impacts to bull trout and bull trout habitat from the emergency response measures in 2016 and the bridge replacement work described 2018 Opinion.

The Project as modified will result in adverse effects on bull trout and bull trout critical habitat within approximately 5,000 linear feet (0.9 river mile) of habitat in the lower reaches of the core area. These effects are limited in scale and are minor relative to the major fluvial processes that affected the Elwha River as a result of dam removal in 2014 and 2015. Because the effects of the action are short-term, small-scale, and highly localized, we do not expect the effects of the action to permanently influence bull trout distribution or habitat use within the Elwha River core area. Consistent with the 2018 Opinion, we anticipate localized adverse effects on individual bull trout and designated bull trout critical habitat will occur from implementation of the proposed action, and none of those effects are expected to result in any measurable reduction in the numbers, distribution, or reproduction of bull trout in the Elwha River core area, the Coastal Recovery Unit, or within the listed range of the species. Considering the localized nature of the effects of the proposed action, we conclude that the conservation role of the action area (and the function of designated bull trout critical habitat) to provide for the connectivity, distribution, and overall abundance of bull trout, will be maintained at the scale of the action area, the core area and critical habitat subunit, the Coastal Recovery Unit for bull trout, and range-wide.

CONCLUSION: BULL TROUT AND DESIGNATED BULL TROUT CRITICAL HABITAT

After reviewing the current status of bull trout and bull trout critical habitat, the environmental baseline for the action area, the effects of the proposed action as modified and the cumulative effects on bull trout, it is the USFWS's Opinion that the revised action, as proposed, is not likely to jeopardize the continued existence of the species or likely to destroy or adversely modify designated critical habitat.

INCIDENTAL TAKE STATEMENT AMENDMENT

This Incidental Take Statement replaces the previously issued Incidental Take Statement that addresses the bull trout.

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. *Harm* is defined by the USFWS as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). *Harass* is defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they become binding conditions of any grant or permit issued to the (applicant), as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHWA 1) fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA must report the progress of the action and its impact on the species to the USFWS as specified in this Incidental Take Statement [50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The USFWS anticipates incidental take of bull trout in the form of harm and harassment from the Elwha core area as a result of the proposed action.

The capture and handling of bull trout during fish exclusion could cause direct injury or mortality. However, the direct take resulting from salvage operations will minimize the incidental take of individual bull trout from stream diversion/dewatering activities. Work area isolation, and fish capture and handling, will result in the following forms and amounts of take:

- 1) Incidental take in the form of *harm* and *harassment* resulting from handling related to fish capture and removal operations during bridge demolition (122 days total; 46 days between July 15 and August 30, 2023 and up to 76 days between June 15 to August 30, 2024).
 - a) Twelve (12) adult, subadult bull trout, or juvenile bull trout will be harassed as a result of fish capture operations.

- b) Two (2) juvenile bull trout be injured or killed as a result of fish capture and removal operations and installation of supersacks prior to bridge demolition. Dewatering and supersack installation will occur over an area of approximately 361,500 square feet (8.3 acres) total between the two IWWW in 2023 and 2024.

The USFWS expects that incidental take of bull trout due to other adverse effects of the action will be difficult to detect or quantify for the following reasons: 1) the low likelihood of finding dead or injured individuals; 2) delayed mortality, and 3) losses may be masked by seasonal fluctuations in numbers. However, pursuant to 50 CFR 402.14(i)(1)(i), a surrogate can be used to express the anticipated level of take in an Incidental Take Statement, provided three criteria are met: (1) measuring take impacts to a listed species is not practical; (2) a link is established between the effects of the action on the surrogate and take of the listed species; and (3) a clear standard is set for determining when the level of anticipated take based on the surrogate has been exceeded.

The USFWS' regulations state that significant habitat modification or degradation caused by an action that results in death or injury to a listed species by significantly impairing its essential behavior patterns constitutes take in the form of harm. Those regulations further state that an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt its normal behavioral patterns constitutes take in the form of harass. Such annoyance can be caused by actions that modify or degrade habitat conditions (e.g., excessive noise or smoke). In cases where this causal link between effects of a federal action to habitat and take of listed species is established, and the biological opinion or incidental take statement explains why it is not practical to express and monitor the level of take in terms of individuals of the listed species, the USFWS' regulations authorize the use of habitat as a surrogate for expressing and monitoring the anticipated level of take, provided a clear standard is established for determining when the level of anticipated take has been exceeded.

The following discussion presents the USFWS' analysis and findings with respect to the three regulatory criteria for use of a surrogate in this Incidental Take Statement to express the anticipated level of take likely to be caused by the proposed action. Criteria #1 was established at the beginning of this section. The acres and linear feet of habitat in the action area will be roughly proportional to the number of individuals injured or killed, which satisfies Criteria #2. Criteria #3 will be satisfied by FHWA monitoring take as described in RPM #1. The incidental take is expected to be in the forms and durations as follows:

- 1) Incidental take of juvenile and subadult bull trout in the form of *harm* resulting from stranding related to fish capture and removal operations prior to bridge demolition (122 days; 46 days between July 15 and August 30, 2023 and up to 76 days between June 15 and August 30, 2024). Dewatering and installation of supersacks prior to bridge demolition will occur over an area approximately 361,500 square feet (8.3 acres).
- 2) Incidental take of juvenile, subadult, and adult bull trout in the form of *harm* (physical injury) from impacts on benthic habitat over an area of 590,000 square feet (13.6 acres) for the duration of construction over two in-water work windows (17 months from June 2023 to

August 2024 and including 2 months for recovery). The USFWS anticipates temporary sublethal effects associated with reduced prey availability and foraging efficiency in foraging habitat.

- 3) Incidental take of juvenile bull trout in the form of *harm* (physical injury or mortality) of juvenile, subadult, and adult bull trout from exposure to episodic periods of elevated turbidity spanning the entire wetted width and encompassing approximately 5,000 linear feet of the Elwha River. This extent will include 1,300 linear feet upstream of the existing bridge (backwatering from bridge replacement work) and another 3,688 linear feet downstream of the existing bridge, including the extent of turbidity 1,800 linear feet downstream of the furthest downstream ELJ.

The potential for elevated turbidity may occur during the 10-hour workday, for as many as 122 working days (two in-water construction seasons; July 15 through August 30, 2023, and June 15 through August 30, 2024). The sublethal effects are considered to be a significant disruption of normal behaviors that creates a likelihood of injury to exposed individuals caused by avoidance behaviors.

- 4) Incidental take in the form of *harm* of all bull trout due to impeded migration due to higher water velocities in an area extending from the existing bridge to 1,888 feet downstream of the existing bridge while construction access and demolition pads are in place and ELJs are being constructed. We expect conditions impeding migration to occur during lower river flows between June 15, 2023 to August 31, 2024 (15 months - 443 days). The effects are considered to be a significant disruption of normal bull trout behaviors causing reduced or missed spawning opportunities for a small numbers of affected adult bull trout.

EFFECT OF TAKE

In the accompanying 2018 Opinion and this amended take statement, the USFWS determined that this level of anticipated take is not likely to result in jeopardy to the bull trout or destruction or adverse modification of designated bull trout critical habitat.

REASONABLE AND PRUDENT MEASURES

The Project incorporates design elements and conservation measures that we expect will reduce permanent effects to habitat and avoid and minimize impacts during construction. We expect that the FHWA will fully implement these measures, and therefore they have not been specifically identified as Reasonable and Prudent Measures (RPMs) or Terms and Conditions.

The USFWS believes the following RPMs are necessary and appropriate to minimize the impacts (i.e., the amount or extent) of incidental take of bull trout:

- 1) Minimize and monitor incidental take of bull trout caused by fish stranding, worksite isolation and fish removal/handling.

- 2) Minimize and monitor incidental take of bull trout caused by elevated turbidity during construction.
- 3) Ensure completion of a monitoring and reporting program to confirm that the take exempted for fish handling and benthic, turbidity, and migration impacts for the proposed action is not exceeded.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following term and condition is required for the implementation of RPM 1:

- 1) The FHWA and WSDOT shall ensure that all fish capture and removal operations are conducted by a qualified biologist, and that all staff participating in the operation have the necessary knowledge, skills, and abilities to ensure safe handling of fish. Fish capture and removal operations shall take all appropriate steps to minimize the amount and duration of handling.
- 2) During installation of cofferdams, dewatering of the work area and fish removal efforts, the FHWA and WSDOT shall ensure that the substrates are level to minimize ponding that pose a stranding risk.
- 3) The FHWA and WSDOT shall document and report all bull trout or other salmonids encountered during fish capture and removal operations (species, number, age, condition, final disposition). The FHWA and WSDOT shall submit a monitoring report to the USFWS' Washington Fish and Wildlife Office in Lacey, Washington, by December 1 following each construction season.

The following terms and conditions are required for the implementation of RPM 2:

- 1) The FHWA and WSDOT shall monitor turbidity levels in the Elwha River during sediment-generating activities.
 - a) Erosion control activities, including minimization measures and BMPs, shall be monitored and corrective actions take, if necessary to ensure protection of riparian areas and eliminate the potential for BMPs failing along the river.
 - b) The WSDOT shall have qualified environmental compliance staff conduct on site to monitor water quality conditions during in-water work and to monitor for construction-related exceedances. Should exceedances occur, in-water work activities shall be stopped until plume dissipates within the work area. The FHWA/WSDOT shall contact the

USFWS consulting biologist at the Washington Fish and Wildlife Office in Lacey, Washington, to determine what additional measures may be necessary to reduce turbidity levels.

- 2) The FHWA and WSDOT will submit a surface water quality monitoring report (focused on turbidity and suspended sediment) to the USFWS Washington Fish and Wildlife Office in Lacey, Washington, by April 1 following each construction season. The report shall include, at a minimum, the following: 1) dates, times, and locations of construction activities; 2) monitoring results, sample times, locations, and measured turbidities (in NTUs; 3) a summary of construction activities and measured turbidities associated with those activities; and 4) a summary of corrective actions taken to reduce turbidity.

If, in cooperation with other permit authorities, the FHWA and WSDOT develop a functionally equivalent monitoring strategy (e.g., intensive monitoring by Project area or activity, followed by validation and routine monitoring), they may submit this plan to the USFWS for review and approval in lieu of the above monitoring requirements. This strategy must be submitted to the USFWS a minimum of 60 days prior to construction.

In order to be approved for use in lieu of the above requirements, the plan must meet each of the same objectives.

The following term and condition is required for the implementation of RPM 3:

- 1) The FHWA and WSDOT shall ensure the amount and extent of take is monitored by preparing a report identifying any incidental take associated with project activities and describing conservation measures implemented to minimize take. The report shall include a description of construction activities conducted, the duration of all activities, conserving measures implemented. The annual monitoring report will include, at a minimum, the following:
 - a) Project identification:
 - i) Project name: US 01 Elwha Bridge Replacement Project.
 - ii) USFWS tracking number: 2023-0058782; XRef 01EWF00-2017-F-1400.
 - iii) WSDOT contact person.
 - b) Construction details:
 - i) Starting and end dates of each completed in-water construction season.
 - ii) Photos of BMPs utilized during construction, and any of those left in place over winter between in-water work windows.
 - iii) A description of any elements of the project that were constructed differently than proposed each work window.

- iv) Map indicating the final locations where ELJs were constructed within the approved extent of construction impacts.
- c) Monitoring Reporting:
 - i) Annual water quality monitoring reports.
 - ii) Annual fish capture and removal reports.
 - iii) Submit monitoring reports by December 1 following each in-water work season to the U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office electronically to WashingtonFWO@fws.gov, attention Coastal Lowlands Aquatic and Marine Zone Manager.

The USFWS has determined that no more than the numbers described above will be incidentally taken as a result of the proposed action. The RPMs, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The FHWA must immediately provide an explanation of the causes of the taking and review with the USFWS the need for possible modification of the reasonable and prudent measures.

The USFWS is to be notified within three working days upon locating a dead, injured or sick endangered or threatened species specimen. Initial notification must be made to the nearest USFWS Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Contact the USFWS Law Enforcement Office at (425) 883-8122, or the USFWS' Washington Fish and Wildlife Office at (360) 753-9440.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The USFWS offers the following conservation recommendations:

- 1) The FHWA and WSDOT should monitor plantings of trees and shrubs for at least 3 years in restored areas to ensure plant survival. Plantings should meet the following minimum requirements: 1) 100 percent survival for trees and shrubs from initial planting up to for the first year, with replacements as needed to achieve this value.

- 2) The FHWA and WSDOT should replace the fish passage barrier on Indian Creek to provide unimpeded passage for all fish species and life stages at all times of year.
- 3) To retain mature trees that will be cut within the river system, all large trees removed from upland and riparian areas associated with the Project should be stockpiled and placed on gravel bars or within the river following the completion of construction.

In order for the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request for formal consultation. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding the 2018 Opinion, the amended Incidental Take Statement, our response to your concurrence requests, or our shared responsibilities under the ESA, please contact Leslie Durham (leslie_durham@fws.gov), or Adam Griesemer (adam_griesemer@fws.gov).

Sincerely,

for Brad Thompson, State Supervisor
Washington Fish and Wildlife Office

cc:

FHWA, Olympia, WA (L. Liu)
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***In Litteris* REFERENCES**

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Molenaar, D. 2023b. Biology Program Manager, Washington State Department of Transportation, Olympic Region. Email to: Leslie Durham, WSDOT Liaison, U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, Lacey, Washington. May 23, 2023. Topic: Elwha BA information need. Revised action area map for the U.S. 101 Elwha River Bridge Replacement Project Reinitiation.