United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
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Lacey, Washington 98503

SEP - 9 2016

In reply, refer to:
13410-2011-F-0063-R007
XRef: 13410-2011-F-0063
XRef: 13410-2011-F-0063-R001
XRef: 13410-2011-F-0063-R002
XRef: 13410-2011-F-0063-R003
XRef: 13410-2011-F-0063-R004
XRef: 13410-2011-F-0063-R005
XRef: 13410-2011-F-0063-R006

Daniel M. Mathis
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ATTN: Anthony Sarhan

Dear Mr. Mathis:

On April 15, 2011, the U.S. Fish and Wildlife Service (Service) concluded formal consultation on the State Route 520, Interstate-5 to Medina Bridge Replacement and High Occupancy Vehicle Project (project) and provided a Biological Opinion (Opinion) to the Federal Highway Administration (FHWA). Final design and construction of the project is proceeding under a series of design-build contracts, administered by the FHWA and Washington State Department of Transportation (WSDOT). Our offices continue to meet and discuss implementation of the project and design-build contracts.

On June 6, 2016, the FHWA requested a seventh reinitiation of formal consultation to update the design of the West Approach Montlake Lid (WAML) phase of the project. Changes include revisions to the project construction sequence as well as changes in stormwater management. This letter amends the Opinion to address changes to the spatial and temporal extent of effects to the bull trout (*Salvelinus confluentus*) and designated bull trout critical habitat but does not modify implementing Reasonable and Prudent Measures (RPMs) or Terms and Conditions

(T&Cs). This formal reinitiation of consultation was completed in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act).

Consultation History

On December 6, 2011, we received a letter from the FHWA identifying changes associated with the Floating Bridge and Landings (FB&L) phase of the project, and requesting reinitiation of formal consultation. On January 10, 2012, the Service responded with a letter (XRef: 13410-2011-F-0063-R001) concluding that the identified design and construction changes will not introduce new effects, result in additional measurable effects to the bull trout or designated bull trout critical habitat, or exceed the limits of incidental take specified in the Opinion. Amendment of the Opinion was not necessary, and therefore the Incidental Take Statement (ITS), required RPMs, and implementing T&Cs remained unchanged.

On July 23, 2012, the FHWA again requested reinitiation of formal consultation, citing the need for a work window extension for construction activities along the east approach. On July 27, 2012, the Service responded with a letter and amendment to the Opinion and ITS (XRef: 13410-2011-F-0063-R002). The Service determined that the work window extension will not introduce new effects or result in additional, measurable effects to the bull trout or designated bull trout critical habitat. The Service found that the rationale and conclusions reached by the Opinion remained valid (Jeopardy and Adverse Modification Determinations; Opinion, pp. 113-116), and no changes to the required RPMs and implementing T&Cs were necessary.

On November 28, 2012, the FHWA again requested reinitiation of formal consultation for two additional design and construction changes. These changes included the use of barges, temporary mooring dolphins, and anchors for staging construction north of the new floating bridge alignment and west approach. The changes also included the use of additional work trestles and drilled shaft templates needed for construction of the temporary west connection bridge (WCB) between the new floating bridge alignment and existing west approach. On January 3, 2013, the Service responded with a letter (XRef: 13410-2011-F-0063-R003) concluding that the changes would not introduce new effects, result in additional measurable effects to the bull trout or designated bull trout critical habitat, or exceed the limits of incidental take specified in the Opinion. Amendment of the Opinion was not necessary, and therefore the ITS, required RPMs, and implementing T&Cs remained unchanged.

On July 26, 2013, the FHWA requested a fourth reinitiation of formal consultation on the Project to address design and construction updates as well as the use of the Kenmore Support Yard and Navigation Channel. That reinitiation (XRef: 13410-2011-F-0063-R004) amended the Opinion and ITS to address changes to the spatial and temporal extent of effects to the bull trout and designated bull trout critical habitat. The reinitiation included new and modified RPMs and implementing T&Cs and was completed in accordance with section 7(a)(2) of the Act.

On October 22, 2014, the FHWA requested a fifth re-initiation of formal consultation to address effects of underwater noise from impact pile driving based on monitoring results from the WCB

construction. This update also included the estimated effects of impact pile driving for the West Approach Bridge North (WABN) phase based on the underwater noise monitoring results for the WCB phase, and a request to change the due date of monitoring reports. On March 19, 2015, we received another request to amend the in-water impact pile driving work window. On April 29, 2015, the Service responded with a letter (XRef: 13410-2011-F-0063-R005) that amended the Opinion and ITS to address changes to the spatial and temporal extent of effects to the bull trout and designated bull trout critical habitat. The Service found that the rationale and conclusions reached by the Opinion remained valid and did not change to the RPMs and implementing T&Cs.

On December 4, 2015, the FHWA requested a sixth reinitiation of formal consultation to provide details on the bridge demolition activities associated with the FB&L construction phase. The reinitiation also updated the schedule and duration of existing and temporary structures associated with the FB&L construction phase resulting from construction delays and provided an analysis of the unexpected exceedance of predicted sound level thresholds resulting from impact pile driving. Lastly, this reinitiation updated activities at the Union Bay Natural Area wetland mitigation site and corrected previous reporting errors. That reinitiation (XRef: 13410-2011-F-0063-R006) amended the Opinion and ITS to address changes to the spatial and temporal extent of effects to the bull trout and designated bull trout critical habitat. The reinitiation modified the RPMs and implementing T&Cs and was completed in accordance with section 7(a)(2) of the Act.

Modifications to the Action

The FHWA is proposing design and construction schedule changes to the WAML phase of the SR520 project. The layout of the new design is shown in Enclosure 1. During this phase, WSDOT will construct the West Approach Bridge South (WABS), which is the eastbound bridge lanes; the Montlake Lid; and eastbound and westbound high occupancy vehicle (HOV) lanes extending from the Montlake Lid to bridge. The WABS alignment has been shifted to the north compared to the original design, and the bridge abutment has been moved 50 feet to the west. The Montlake Lid has been shortened from 1,400 to 800 feet and a 70-foot wide land bridge for a regional shared use path has been added east of the lid near the west approach bridge abutments. Stormwater facilities have been expanded to accommodate new pollutant-generating impervious surface (PGIS) exposed by shortening the Montlake Lid.

The WAML phase includes construction of a westbound HOV direct access ramp to the Montlake Lid and an eastbound HOV direct access ramp from the Montlake Lid. The access ramps were originally designed to be separate structures from WABN and WABS. The shortened lid configuration has eliminated the need for the access ramps to meet a tall lid portal, allowing the ramps to be more integrated with WABN and WABS and reducing the bridge footprint. The design revision reduces overwater cover by approximately 0.8 acre, and reduces the number of drilled shafts and columns needed to support the WABS (Table 1).

The WABS will require construction of work bridges adjacent to the existing bridge. The work bridges will allow construction and demolition in shallower waters that will not support barges. Isolated work platforms are proposed to support drilled shaft and column construction.

Table 1. Changes to the WABS Design

Project Element	BA Design	Current Design
Schedule	2013 – 2017	2018 - 2022
Work bridge piles	1,100	1,069
Work bridge area	7.2 acres	7.3 acres
Drilled shaft (no.)	111 (98 in water)	87 (78 in water)
Drilled shaft (area)	79 sq. ft. ea.	79 to 113 sq. ft. ea.
Bridge deck area	7.8 acres	7.0 acres

Construction Sequence

Construction activities for this phase of the project were originally scheduled for 2013-2017, and take associated with various activities was calculated for each year. Construction activities are now scheduled to occur between 2018 and 2022. Changes in impacts per year are listed below under "Effects of Changes to the Proposed Action on Bull Trout". No construction on the WAML phase is anticipated prior to 2017, when the WABN phase is completed. Traffic will then be shifted from the existing west approach span onto the new structure, allowing the existing bridge to be demolished and WABS to be constructed in its place.

Construction Year 1 (2018)

Beginning in the fall of 2018, work bridges and finger piers will be constructed along the existing Union Bay Bridge and Lake Washington Blvd eastbound on-ramp during the approved in-water work windows. Pile-driving activities are expected to continue into 2019. Work bridges will be in place for all five years to facilitate construction and demolition activities. Once the work bridges are complete, the existing west approach span will be demolished. The existing bridge substructure will be removed first, followed by the remaining columns. Columns will be cut below the mudline with an underwater wire saw or hydraulic concrete shear. The contractor will backfill the holes with native material to the extent possible, then fill any voids with clean sand and/or gravel.

Construction Years 2 - 4 (2019 – 2021)

In-water drilled shaft casings will be installed in early 2019 following bridge demolition. Cast in place columns will be constructed on top of the drilled shafts, and the bridge superstructure then placed on top of the columns. These over-water work activities are anticipated to take place until spring of 2021.

Construction Year 5 (2022)

Removal of the work bridges and the in-water piles will begin in October of 2021 and continue into the early part of 2022. The HOV direct access ramps to and from the Montlake Lid will be completed during this time, in addition to lighting, signage, fire protection and barriers. The final stage of construction will consist of site cleanup and demobilization. The WABS is scheduled to be open to eastbound traffic in November 2021.

Stormwater Management

Shortening the Montlake Lid creates 3.1 acres of additional PGIS by exposing more roadway surface to stormwater runoff. Stormwater facility M (referred to as WR-PR in the original BA) has been expanded to accommodate the additional stormwater runoff. Facility M now consists of two separate facilities, one on the north side of SR520 (M-North) and one on the south (M South) (Enclosure 2). A portion of threshold discharge area (TDA) 12 that was previously identified as discharging to the City of Seattle's combined sewer system (CSS) will now be routed to the proposed Seattle S5-North treatment facility. This change results in an additional 2.45 acres discharging to Lake Washington after receiving basic water quality treatment, consistent with the City's stormwater manual.

The WAML project will affect five outfalls (Enclosure 3). The changes to these facilities are as follows:

- The WS-PR from the BA Design (which coincides with the existing SEA-M3 location) is a proposed outfall that is now known as WSDOT M-North and will be constructed as part of the WABN phase. The outfall will be approximately 30 feet landward of the ordinary high water mark (OHWM) and discharge to a rounded-rock-lined ditch extending down to the low water elevation. The stormwater treatment facility discharging at this location is slightly smaller, and now provides enhanced treatment for 18.63 acres of PGIS (down from 21.31 acres identified in the initial consultation), in part because some stormwater cannot be routed there due to design changes affecting the Montlake Lid.

- WS-E is an existing stormwater outfall that will be abandoned. The portion of the pipe extending below the OHWM will be removed and the remainder will be plugged at some point landward. Disturbance to the shoreline or lakebed will be restored to match surrounding grades. Two new outfalls not previously described will be built in the immediate vicinity of this outfall, WSDOT M-South and City S5-North (Enclosure 2).

- WSDOT M-South will discharge from an enhanced water quality treatment pond south of the Montlake Lid through a 2-foot diameter pipe onto a riprap pad approximately 0.95 feet above the OHWM. A total of 3.66 acres of PGIS will be treated at this outfall.

- City S5-North will discharge immediately south of WSDOT M-South. The design of this outfall is identical to WSDOT M-South. Runoff from a total of 2.45 acres of PGIS from

city streets that was previously proposed to go the City of Seattle CSS will now be directed to this outfall. Stormwater runoff will receive basic treatment per the city's stormwater manual using a media filtration system prior to discharge.

- RWB-F is an existing outfall for city streets that is now known as City S5-South. This outfall currently discharges water from approximately 0.61 acres of PGIS. The WAML project will reduce this area to 0.21 acres of PGIS treated to a basic stormwater standard using a media filtration system prior to discharge.

- Stormwater from roughly 0.06 acres of PGIS will discharge into the City of Seattle CSS. Discharges to the CSS are discussed in Section 6.3.4 and Appendix J of the Project BA.

Changes to outfalls and PGIS are summarized in Table 2.

Table 2. Existing and Proposed Conditions of TDAs Discharging to Surface Water Outfalls

Original Design				Proposed Design			
Previous Discharge Point	**Receiving Waterbody**	**Existing PGIS (acres)**	**Proposed PGIS (acres)**	**Proposed Discharge Point**	**Receiving Waterbody**	**Existing PGIS (acres)**	**Proposed PGIS (acres)**
WS-E	Union Bay	1.28	0.13	City S5-North	Union Bay	1.28	2.45
WS-PR and WS-E	Union Bay	19.67	21.31	WSDOT M-North	Union Bay	19.67	18.63
				WSDOT M-South			3.66
RWB-F	Union Bay	0.61	0.40	City S5-South	Union Bay	0.61	0.21
SEA-G CSO	Puget Sound	0	0.06	Combined Sewer Basin	Puget Sound	0	0.06
Total		**21.56**	**21.90**	**Total**		**21.56**	**25.00**

Effects of the proposed action differ slightly in their geographic extent and duration compared to previous analyses; however, the changes do not result in effects that were not analyzed in the original Opinion. The effects from an increased duration of elevated suspended sediment and increased underwater sound levels will be short-term and temporary; the effects of increased stormwater pollutant loading will be intermittent but permanent for the life of the project.

Elevated Turbidity

The original Opinion quantified the area that would be subjected to elevated suspended sediment from the proposed action. Table 3 compares the impacts from suspended sediment from the original proposal to the current design. Under the current design the extent of turbidity is generally less than what was predicted between 2013 and 2015 in the original BA, but will increase between 2016 and 2019, as well as in 2022. The spatial extent of turbidity is shown in Enclosure 4.

Table 3. Changes in Areas (Acres) Exposed to Suspended Sediment per Construction Year

Design	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Union Bay										
Original Design	19.5	17.3	25.6	0	19.5	22.4	0	0	0	0
Current Design	0	19.1	24.3	24.9	20.3	22.5	20.1	0	0	22.5
Net Difference	**-19.5**	**+1.8**	**-1.3**	**+24.9**	**+0.8**	**+0.1**	**+20.1**	**0**	**0**	**+22.5**
West Approach										
Original Design	25.8	31.6	39.7	0	25.8	23.2	0	0	0	0
Current Design	9.3	2.5	29.7	10.5	31.6	43.8	29.4	0	0	31.5
Net difference	**-16.5**	**-29.1**	**-10.0**	**+10.5**	**+5.8**	**+20.6**	**+29.4**	**0**	**0**	**+31.5**

Effect of the Changes to the Proposed Action on Bull Trout

The effects of turbidity will be episodic during demolition activities. Exposure to elevated suspended sediments may cause bull trout to alter their migration routes, but most bull trout in Lake Washington are adults and subadults which can tolerate short-term increases in suspended sediment and are not likely to be harmed by brief exposure. The area of potential exposure of bull trout to elevated levels of suspended sediments will substantially increase in 2016 at Union Bay (additional 24.9 acres) and 2019 at Union Bay (additional 10.5 acres) and West Approach (additional 29.4 acres). However, bull trout are rare in the Lake Washington watershed and occur in low to very low numbers. Therefore, it is unlikely that the total number of exposed and affected individuals will increase substantially.

Underwater Sound Levels

Underwater noise will be generated during installation of steel piles to support work bridges. Work in this area was anticipated to end in 2016, but due to delays will extend into 2017 and 2018. As many as 1,021 piles will be driven in water, slightly less than the 1,100 piles estimated in the original BA. Sound levels of 183 dB_{SEL}[1] could extend as far as 117 meters from the source, and sound levels of 150 dB_{RMS}[2] could extend as far as 631 meters from the source (Table 4; Enclosure 5).

Table 4. Total Area Exposed to Elevated Sound Exposure Levels per Construction Year.

Area	Noise Level	Ensonified Area (Acres) per Construction Year					
		2013	2014	2015	2016	2017	2018
Union Bay	183/187 dB_{SEL}	0	28.0	0	29.0	29.0	32.1
	150 dB_{RMS}	0	122.1	0	128.1	128.1	72.0
West Approach	183/187 dB_{SEL}	13.4	52.8	0	43.0	0	71.0
	150 dB_{RMS}	356.6	271.0	0	364.6	0	292.2

[1] Decibel sound exposure level
[2] Decibel root mean square

The Union Bay and West Approach areas west of Foster Island are not extensively used by bull trout. Very few bull trout would experience significant behavioral disruption in this area. Greater numbers of bull trout use the area east of Foster Island as the migratory route to and from south Lake Washington and the Cedar River sub-basin. Pile driving may significantly disrupt the normal behaviors of a greater, but still relatively small number of individual bull trout in that area.

Pollution Loading and Dilution Zones

The project will discharge runoff from PGIS to five outfalls. Stormwater pollutant loads and concentrations (measured in micrograms per liter [μg/L] or for pollutants of concern (total suspended solids [TSS], total copper, dissolved copper, total zinc, and dissolved zinc) were assessed using the HI-RUN model (WSDOT 2009). Results indicate that loading of TSS and total metals will decrease at every outfall. There is no difference in modeled dissolved zinc concentrations at outfalls WS M-North and WS-M South, and only a slight increase at City S5-North. Dissolved zinc concentrations decrease at the City-S5-South outfall. Dissolved copper increases for every outfall except the CSS (Table 5).

Dilution zones were calculated for the three outfalls that had a P (exceed) value above 0.45: WS M-North, WS M-South, and City-S5-North. Dilution zones for dissolved copper range from 4 to 7 feet, and ranged from 20-33 feet for dissolved zinc (Table 6). Bull trout could be exposed to elevated levels of stormwater pollutants within these dilution zones. However, discharges will occur in areas of south Lake Union that do not provide high quality habitat for bull trout, and bull trout are therefore unlikely to be present and therefore exposed to elevated pollutant levels.

Table 5. Modeling Results of Hi-Run Receiving Water End of Pipe Loading (μg/L) for all Project Outfalls.

TDA	Existing/Proposed	TSS	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
WS M-North	Existing	4755	1.21	0.28	7.38	2.1
	Proposed	776	0.67	0.41	3.2	2.1
Net Difference		**-3979**	**-0.54**	**0.13**	**-4.18**	**0**
WS M-South	Existing	956	0.24	0.06	1.48	0.42
	Proposed	152	0.13	0.08	0.63	0.42
Net Difference		**-804**	**-0.11**	**0.02**	**-0.85**	**0**
City-S5-North	Existing	579	0.15	0.03	0.9	0.26
	Proposed	102	0.09	0.05	0.42	0.28
Net Difference		**-477**	**-0.06**	**0.02**	**-0.48**	**0.02**
City-S5-South	Existing	277	0.07	0.02	0.43	0.12
	Proposed	8.8	0.01	0.01	0.04	0.02
Net Difference		**-268.2**	**-0.06**	**-0.01**	**-0.39**	**-0.1**
Combined Sewer System	Existing	215	0.19	0.13	0.93	0.64
	Proposed	226	0.2	0.13	0.98	0.67
Net Difference		**11**	**0.01**	**0**	**0.05**	**0.03**

Table 6. Summary of Stormwater Dilution Modeling Results for Project Outfalls

Outfall	PGIS (Acres)	Receiving Water Body	Dilution Distance	
			Dissolved Copper (feet)	Dissolved Zinc (feet)
WSDOT M-North	18.63	Lake Washington (Union Bay)	6	33
WSDOT M-South	3.66	Lake Washington (Union Bay)	7	29
City-S5-South	2.45	Lake Washington (Union Bay)	4	20

Effect of the Changes to the Proposed Action on Bull Trout Critical Habitat

The designation(s) of critical habitat for bull trout use(s) the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7214) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. Please note that references to PCEs in the following analysis should be viewed as synonymous with PBFs.

Our analysis of effects to critical habitat relies on the following four components: (1) the *Status of Critical Habitat*, which evaluates the rangewide condition of designated critical habitat for the bull trout in terms of PBFs or PBFs, the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PBFs or PBFs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects*, which evaluates the effects of future, nonfederal activities in the action area on the PCEs or PBFs and how that will influence the recovery role of affected critical habitat units.

The proposed federal action is evaluated to determine if it would likely result in a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of bull trout. Such alterations may include, but are not limited to, those that alter the PBFs essential to the conservation of a species or that preclude or significantly delay development of such features.

Six PBFs are present in Lake Washington; project changes will have adverse effects to four of those PBFs beyond what was considered in the original Opinion.

(2) *Migration 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 changes will result in additional temporary adverse effects to this PBF due to the greater duration of turbidity and exposure of bull trout to elevated underwater sound levels (Table 5). Temporary exposures may impede or discourage free movement through the action area, prevent individuals from exploiting preferred habitats, and/or expose individuals to less favorable conditions.

Changes in project design will also have persistent effects to surface water quality resulting from treated and untreated stormwater discharges. Discharge events will be episodic and are more likely to occur during winter months. Discharge events will result in measurable mixing or dilution zones, where dissolved metal concentrations are sufficient to result in adverse sub-lethal effects, including avoidance response and reduced olfactory sensory responsiveness. Discharge events will create temporary conditions that may impair free movement through the action area and/or temporarily displace bull trout from refugia or preferred habitats; however, stormwater outfalls for this phase of the project will be located in areas that provide low-quality habitat for bull trout where few bull trout are expected to occur, minimizing the potential for bull trout exposure.

Given the temporary and localized nature of these impacts, this PBF will retain its current level of function in the action area.

(3) *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

The proposed action will result in temporary adverse effects to this PBF. Higher levels of suspended sediment and underwater sound, as well as reduced surface water quality resulting from increased stormwater runoff, could adversely affect juvenile Chinook or sockeye salmon that are preferred bull trout prey species. Construction activities will create conditions which benefit large and smallmouth bass and could, at least hypothetically, lead to increased predator numbers or density in the short term. Outmigrating juvenile Chinook and sockeye salmon are preferred prey species, and might experience measurable short term declines in numbers. However, given the nature, extent, and duration of these adverse effects, we expect that within the action area this PBF will not exhibit a discernable decrease of function from the current level.

(8) *Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

The proposed action will result in temporary adverse effects to this PBF by extending the duration of additional levels of suspended sediments (until 2022). In addition, the proposed action will also have persistent effects to surface water quality resulting from treated and untreated stormwater discharges, as discussed under PBF 2, above. Because the effects will be temporary and limited in extent, we expect that within the action area this PBF will not exhibit a discernable decrease of function from the current level.

(9) *Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.*

The proposed action will result in temporary adverse effects to this PBF. Project activities will create conditions which favor large and smallmouth bass and could, at least hypothetically, lead to increased predator numbers or density in the short term. However, the subadult and adult bull trout documented throughout the Lake Washington watershed have all been mature individuals ranging in size between 330 and 604 mm (12 - 24 inches). We expect that bull trout in this size range are not a focus for foraging nonnative fish predators.

In the long term, we do not expect that the proposed action will create markedly different conditions for native or nonnative piscivores that feed on bull trout prey. The proposed action will do little to measurably change predator-prey dynamics at the scale of the action area.

Furthermore, we expect that any measurable temporary effects to nonnative predator numbers or density will not change the primary role that native cutthroat trout play as the system's dominant piscivore. We expect no measurable, permanent adverse effects to this PBF.

Minimization Measures

The contractors will fully implement all conservation measures, RPMs, and T&Cs that are included in the Service's Opinion. All work will comply with the established in-water work windows of September 1 – April 30 in Union Bay and October 8 to April 15 in the West Approach. To minimize take caused by elevated turbidity and sedimentation during construction, the FHWA shall monitor turbidity levels during sediment-generating activities and submit monitoring reports to the Washington Fish and Wildlife Office in Lacey, Washington. Should turbidity levels approach the thresholds specified in the water quality monitoring plan, the contractor will use a turbidity curtain to contain turbid waters, as well as slow the operation down to achieve better water quality. Any equipment used underwater will contain vegetable based or other similar hydraulic oil. To minimize take cause by elevated underwater sound levels, the FHWA will use a vibratory hammer to the fullest extent possible when installing steel piles below the OHWM, and monitor in-water sound generation and attenuation when installing steel piles with an impact hammer.

Summary of Changes in the Action

The proposed changes in the action will result in additional measurable effects during project construction and operation. Applying the same methods of analysis and assumptions used previously (Opinion, pp. 43-57), we conclude that the changes will result in additional adverse effects to the bull trout and designated bull trout critical habitat.

The changes summarized above extend the duration of exposure of bull trout to elevated suspended sediment and underwater sound levels in Union Bay and at the West Approach, and increase exposure of bull trout to elevated pollutant loads in Union Bay. The area of elevated

suspended sediment generated by project activities will extend until 2022. The area ensonified with sound pressure levels (SPLs) sufficient to cause injury or death to bull trout will extend until 2018. However, most impacts will be limited to south Union Bay surrounding the Arboretum, an area of low quality habitat that is not attractive to bull trout. It is therefore unlikely that the total number of individuals exposed to and affected by these stressors will increase substantially. The minimization measures summarized above will avoid and further minimize potential effects to bull trout and designated bull trout critical habitat.

Jeopardy and Adverse Modification Determinations

This letter addresses design and construction changes for the WAML contract and construction phase. These changes will increase the extent of exposure of bull trout to temporary adverse effects from elevated suspended sediments, underwater sound; and intermittent exposure to elevated pollutants loads in stormwater.

We expect these project modifications as described above to result in temporary and intermittent adverse effects to adult and subadult bull trout in the action area. These adult and subadult bull trout may originate from any of three bull trout core areas (Puyallup, Snohomish-Skykomish, and Skagit River core areas), and fifteen (or more) local populations. Based on location and proximity to bull trout core areas and local populations, it is reasonable to conclude that relatively few individuals will be exposed to the action's short or long term effects.

Although the extent of area within which bull trout will be exposed to turbidity or elevated underwater SPLs will continue longer than originally anticipated, we do not expect a measurably greater number of bull trout to be exposed to the stressors than was analyzed in the original Opinion. We still expect the number of bull trout exposed to elevated suspended sediment levels sufficient to alter behavior or cause physiological stress to be very low. We expect the number of bull trout killed, injured, or exposed to SPLs sufficient to result in sub-lethal physiological stress and/or significant disruption of normal behaviors as a result of elevated SPLs to be very low (a few individuals at most). Similarly, only a very few bull trout will be exposed to stormwater pollutants discharged in marginal habitat not preferred by bull trout. Because these few individuals originate from any of the fifteen (or more) local populations, we expect that no measurable effects to bull trout abundance will be evident at the scale of the local population or core areas.

The anticipated permanent and temporary project effects will not measurably reduce bull trout numbers, reproduction, or distribution at the scale of the Puget Sound interim recovery unit or coterminous range.

Within the action area, bull trout critical habitat will retain its current ability to establish functioning BPFs. The anticipated effects of the action, combined with the effects of interrelated and interdependent actions, and the cumulative effects associated with future State, tribal, local, and private actions will not prevent the BPFs of critical habitat as described in the Opinion from being maintained, and will not degrade the current ability to establish functioning BPFs at the scale of the action area. Critical habitat within the action area will continue to serve the intended

conservation role for the species at the scale of the core areas (Puyallup, Snohomish-Skykomish, and Skagit River core areas), Coastal Recovery Unit and coterminous range.

The action, as now proposed, and the conclusions reached here do not fundamentally change the Service's previous overarching Jeopardy and Adverse Modification Determinations, or the supporting rationale previously expressed in our Opinion (pp. 113-116). We find that the rationale and conclusions reached by the Service's original Opinion and all subsequent reinitiations remain valid and essentially unchanged.

Conclusion

The current status of the bull trout in its coterminous range, the current status of designated bull trout critical habitat in its coterminous range, the environmental baseline for the action area, the direct and indirect effects of the proposed action, the effects of interrelated and interdependent actions, and the cumulative effects that are reasonably certain to occur in the action area have not changed from those analyzed in the Opinion. The Service has determined that the identified construction and operation changes will result in a change to the timing of the proposed work, and will result in greater extent of effects to a few individual bull trout. The project changes will also result in temporary and intermittent permanent effects to a greater extent of critical habitat. However, the action, as now proposed, is not expected to change the Service's previous Jeopardy and Adverse Modification Determinations, or the supporting rationale previously expressed in our Opinion (pp. 113-116). We find that the rationale and conclusions reached by the Service's original Opinion remain valid.

This reinitiation further amends the Opinion and ITS (Enclosure 6) to address changes to the spatial and temporal extent of foreseeable effects to the bull trout and designated bull trout critical habitat. The enclosed ITS reflects the current and previous revisions to quantified incidental take, including those issued on July 27, 2012 (FWS Ref. No. 13410-2011-F-0063-R002); April 29, 2015 (FWS Ref. No. 13410-2011-F-0063-R005); and February 11, 2016 (FWS Ref. No. 13410-2011-F-0063-R006) and replaces previous versions. The Service has determined that the identified design and construction changes will not result in additional, measurable effect to the bull trout or designated bull trout critical habitat. Accordingly, the required RPMs and implementing T&Cs remain unchanged.

With the issuance of our amended ITS, this letter concludes reinitiated formal consultation on the State Route 520 Interstate-5 to Medina: Bridge Replacement and HOV Project. If you have any questions about this letter or our shared responsibilities under the Endangered Species Act of 1973 (as amended), please contact Mark Miller at (360) 534-9347, of my staff.

Sincerely,

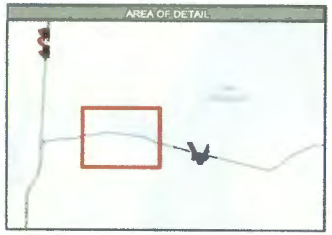
Mark G. Miller

for Eric V. Rickerson, Manager
Washington Fish and Wildlife Office

cc:
FHWA, Seattle, WA (A. Sarhan)
WSDOT, Seattle, WA (M. Meade)
NMFS, Seattle, WA (M. Grady)

Enclosures

Enclosure 1 Proposed Design of the West Approach Montlake Lid, I-5 Medina Bridge Replacement and HOV Project



Roadway
Stormwater
Pathway
Greenspace
WABS Bridge Limits
WABN/FB&L Bridge Limits
Ordinary High Water Mark (18.57')

0 250 500 1,000 Feet

Figure 1.
Proposed Design of the
West Approach / Montlake Lid
I-5 to Medina: Bridge Replacement and HOV Project

Enclosure 2 West Approach Montlake Lid (WAML) Proposed Stormwater Facilities, I-5 to Medina Bridge Replacement and HOV Project

Figure 2.
WAML Proposed Stormwater Facilities
I-5 to Medina: Bridge Replacement and HOV Project

Enclosure 3 Project Threshold Discharge Areas (TDAs) and Outfalls – Medina Bridge Replacement and HOV Project

Enclosure 4 Spatial Extent of Turbidity for WAML Demolition and Construction Activities - I-5 Medina Bridge Replacement and HOV Project

Figure 4.
Spatial Extent of Turbidity for WAML Demolition and Construction Activities
I-5 to Medina: Bridge Replacement and HOV Project

Enclosure 5 Pile Driving Noise Limits for WABS Work Trestle and Platforms - I-5 Medina Bridge Replacement and HOV Project

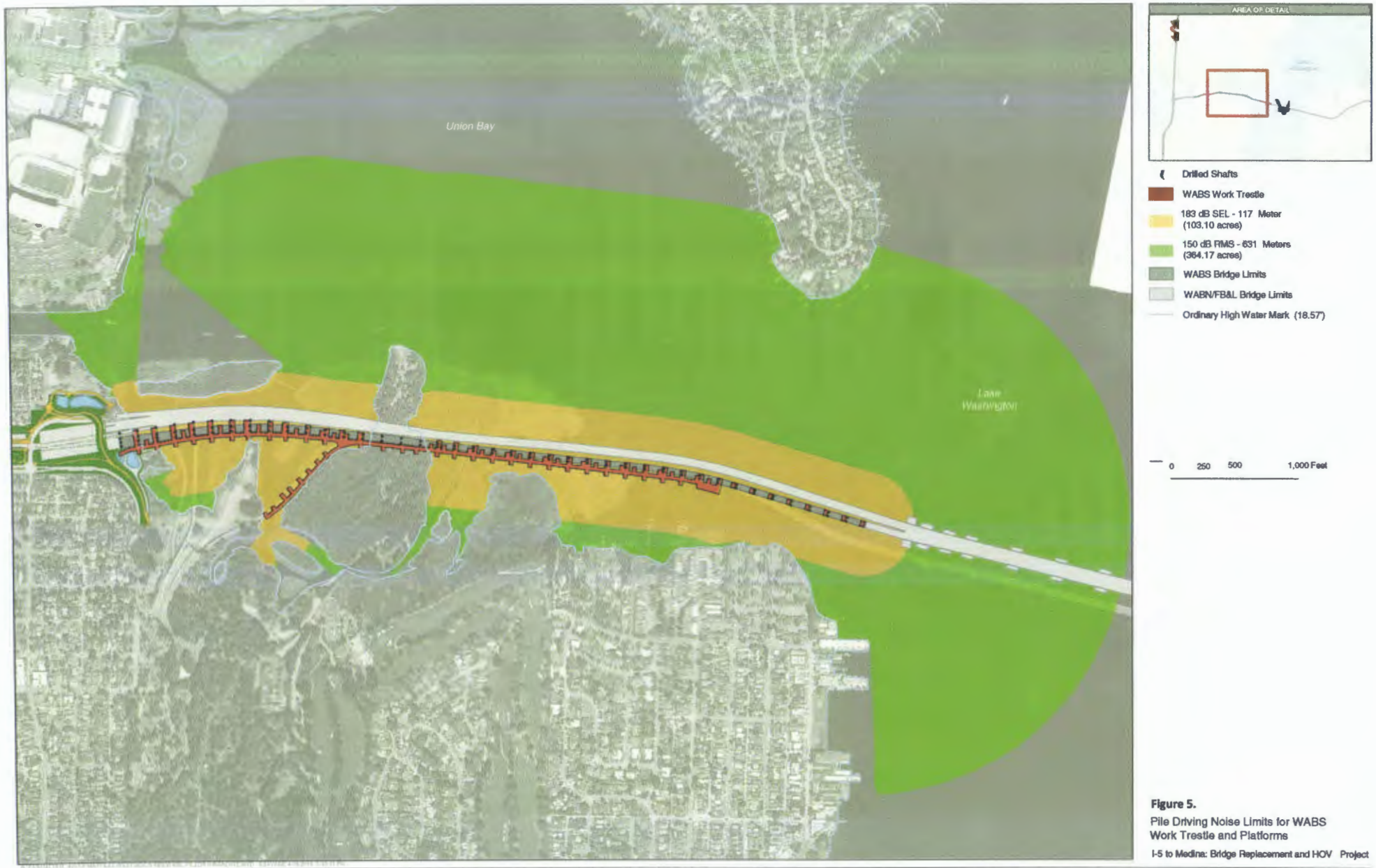


Figure 5.
Pile Driving Noise Limits for WABS Work Trestle and Platforms
I-5 to Medina: Bridge Replacement and HOV Project

Enclosure 6

BIOLOGICAL OPINION
USFWS Reference No. 13410-2011-F-0063
State Route 520, Interstate-5 to Medina Bridge Replacement and HOV Project
Grays Harbor, King, Pierce, Snohomish, Thurston and Whatcom Counties, Washington
Agency:
Federal Highway Administration
Olympia, Washington
Consultation Conducted By:
U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
Lacey, Washington

INCIDENTAL TAKE STATEMENT, as amended on [insert date signed]

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act 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 Service as an act which actually kills or injures wildlife. Such 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 Service 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 Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

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, 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 ITS. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require the contractor or applicant to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit or grant document, 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 Service as specified in the ITS [50 CFR section 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

We anticipate that take in the form of harm and harassment of subadult and adult bull trout from the Puyallup, Snohomish-Skykomish, and/or Skagit River core areas will result from the proposed action.

1. Incidental take of bull trout in the form of ***harm*** (physical injury or mortality) resulting from fish entrainment, capture, and handling at the Port of Tacoma Concrete Technology Corporation (CTC) casting basin.

   - One adult or subadult bull trout will be harmed during ten casting basin gate openings scheduled between August 2012 and June 2014.

2. Incidental take of bull trout in the form of ***harassment*** (stress not reaching the level of physical injury) resulting from fish entrainment, capture, and handling at the Port of Tacoma CTC casting basin.

   - Two adult or subadult bull trout will be harassed during ten casting basin gate openings scheduled between August 2012 and June 2014.

The following forms of incidental take will be difficult to detect or quantify for the following reasons: 1) the low likelihood of finding dead or injured adults, subadults, or juveniles; 2) delayed mortality; and, 3) the relationship between habitat conditions and the distribution and abundance of individuals is imprecise such that a specific number of affected individuals cannot be practically obtained. Where this is the case, we use post-project habitat conditions as a surrogate indicator of take.

3. Incidental take of bull trout in the form of ***harassment*** resulting from degraded surface water quality and exposure to elevated turbidity and sedimentation during construction. Water quality will be degraded intermittently while construction activities are being completed below the OHWM of Portage Bay, Union Bay, and Lake Washington. Take will result when levels of turbidity reach or exceed the following nephelometric turbidity units (NTU) levels:

   i) 84 NTUs above background at any time; or

   ii) 40 NTUs above background for more than 1 hour, continuously; or

   iii) 18 NTUs above background for more than 3 hours, cumulatively, over a 18-hour workday

   iv) 9 NTUs above background for durations approaching two 24-hour days.

   - All adult and subadult bull trout within 300 ft of sediment-generating activities will be harassed during construction within stated in-water work windows, for a period of

approximately 1,500 working days (Portage Bay; August 16 - April 30, 2013-2018), 2,000 working days (Union Bay; 2013-2019, and 2021-2022), 2,000 working days (Lake Washington – West Approach; August 1 - April 30, 2013-2019; and 2021-2022), and 1,245 working days (Lake Washington – East Approach; July 1 - May 15, 2012-2016), respectively.

- All adult and subadult bull trout within 300 ft of sediment-generating activities will be harassed during demolition and removal of existing bridge and approach columns outside stated in-water work windows, for a period of approximately 50 working days (Portage Bay; 2013-2018).

4. Incidental take of bull trout in the form of ***harm*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 165 steel piles along the east approach to Lake Washington, between August 2, 2012, and March 15, 2014 (approximately 200 working days in total).

   - All adult or subadult bull trout within approximately 1,800 ft of piling installation operations in Lake Washington (150 acres during 2012-13; 134 acres during 2013-14) will be harmed.

5. Incidental take of bull trout in the form of ***harm*** as a direct effect of exposure to elevated underwater SPLs resulting from demolition of the transition pier along the east approach to Lake Washington between July 1 and August 15, 2016 (approximately 25 working days in total).

   - All adult or subadult bull trout within approximately 328 ft of hoe ram operations in Lake Washington (14 acres) will be harmed.

6. Incidental take of bull trout in the form of ***harm*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 1,200 steel piles along the west approach to Lake Washington (east of Foster Island). This work will occur between October 8 and April 15 in 2013 – 2019 as described below (approximately 760 working days in total).

   - All adult or subadult bull trout within approximately 384 ft of piling installation operations in Lake Washington (13.4 acres during 2013-14; 52.8 acres during 2014-15; 43 acres during 2016-17; and 71 acres during 2018-19) will be harmed.

7. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 165 steel piles along the east approach to Lake Washington, between August 2, 2012, and March 15, 2014 (approximately 200 working days in total).

- All adult or subadult bull trout within approximately 7,100 ft of piling installation operations in Lake Washington (1,810 acres during 2012-13; 1,760 acres during 2013-14) will be harassed.

8. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from demolition of the transition pier along the east approach to Lake Washington between July 1 and August 15, 2016 (approximately 25 working days in total).

   - All adult or subadult bull trout within approximately 3,280 ft of hoe ram operations in Lake Washington (502 acres) will be harassed.

9. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 1,200 steel piles along the west approach to Lake Washington (east of Foster Island). This work will occur between October 8 and April 15, 2013-2019 as described below (approximately 760 working days in total).

   - All adult or subadult bull trout within approximately 2,070 ft of piling installation operations in Lake Washington (356.6 acres during 2013-14; 271.0 acres during 2014-15; 364.6 acres during 2016-17; and 292.2 acres during 2018-19) will be harassed.

10. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from demolition of the transition pier along the west approach to Lake Washington (east of Foster Island), between August 16 and September 30, 2016 (approximately 45 working days in total).

    - All adult or subadult bull trout within approximately 3,280 ft of hoe ram operations in Lake Washington (680 acres) will be harassed.

11. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 1,069 steel piles in Union Bay, between September 1, 2014, and April 30, 2015, and between September 1, 2016, and April 30, 2019 (approximately 965 working days in total).

    - All adult or subadult bull trout within approximately 2070 ft of piling installation operations in Union Bay (122.3 acres during 2014-15; 128.1 acres in 2016-17; 128.1 acres during 2017-18; and 72 acres in 2018-19) will be harassed.

12. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of 12 steel piles in Union Bay, between May 1, 2015 and May 31, 2015.

    - All adult or subadult bull trout within approximately 2,070 ft of piling installation operations in Union Bay (38.7 acres) will be harassed.

13. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated underwater SPLs resulting from impact pile driving and proofing of approximately 1,300 steel piles in Portage Bay, between September 1 and April 30 of the first, second, and third construction seasons (approximately 700 working days in total).
    - All adult or subadult bull trout within approximately 72 ft of piling installation operations in Portage Bay (10.2 acres during the first construction season; 6.6 acres during the second season; and, 6.6 acres during the third season) will be harassed.

14. Incidental take of bull trout in the form of ***harassment*** as a direct effect of exposure to elevated stormwater pollutant concentrations. Effects to surface water quality will last in perpetuity, but exposure and effects to bull trout will be episodic. Harassment will result when dissolved copper concentrations exceed the sub-lethal neurotoxic threshold of an increase of 2 micrograms per liter (μg/L) over background, or when dissolved zinc concentrations exceed 5.6 μg/L over background.

    - All adult or subadult bull trout within 33 ft of points of stormwater discharge to Lake Union, Portage Bay, Union Bay, and Fairweather Bay (approximately 10 locations in total); and within 70 ft of points of stormwater discharge to Lake Washington (approximately 44 locations in total, along the floating bridge span); in perpetuity, and for the life of the proposed project.

15. Incidental take of bull trout in the form of ***harassment*** resulting from degraded surface water quality and exposure to elevated turbidity and sedimentation along and adjacent to the Kenmore Navigation Channel. Water quality will be degraded periodically and intermittently, when navigating transport barges in support of the project along the federally authorized Kenmore Navigation Channel. Take will result when visible sediment disturbance extends more than 300 feet from the source (i.e., the barge and/or tugboat); and if/when visible sediment disturbance persists for more than 1 hour per event, regardless of physical extent.

    - All adult and subadult bull trout present along the Kenmore Navigation Channel will be harassed for the duration of an estimated 14 future occasions, when barge and tugboat operations in support of the project cause visible sediment disturbance, for a duration of approximately 14 working days (2013-2016).

EFFECT OF THE TAKE

In the accompanying Opinion, we determined that the level of anticipated take is not likely to result in jeopardy to the bull trout.

REASONABLE AND PRUDENT MEASURES

The proposed action incorporates design elements and conservation measures which 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 (T&Cs).

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the impact of incidental take to bull trout:

1. Minimize and monitor incidental take caused by fish entrainment, capture, and handling at the Port of Tacoma CTC casting basin during each of ten casting basin gate openings.

2. Minimize and monitor incidental take caused by elevated turbidity and sedimentation during construction.

3. Minimize and monitor incidental take caused by elevated underwater SPLs from impact driving and proofing of steel piles and hoe ram operation.

4. Minimize and monitor incidental take caused by elevated stormwater pollutant concentrations.

5. Minimize and monitor incidental take caused by degraded surface water quality and exposure to elevated turbidity and sedimentation along and adjacent to the Kenmore Navigation Channel.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA must comply with the following terms and conditions, which implement the RPMs described above. These terms and conditions are non-discretionary.

The following terms and conditions are required for the implementation of RPM 1:

1. The FHWA shall ensure that casting basin pump inlets are screened according to criteria outlined by the National Marine Fisheries Service (NMFS) (NMFS 1997).

2. The FHWA shall ensure that water quality conditions within the partially dewatered casting basin are adequate to support any entrained bull trout. The operations shall use aerators or air stones, as necessary, to provide for the circulation of clean, cold, well-oxygenated water.

3. The FHWA shall ensure that a qualified biologist oversees implementation of fish capture and handling procedures.

4. In the event that fish capture requires the use of electrofishing equipment, the FHWA shall use the minimum voltage, pulse width, and rate settings necessary to immobilize fish. Use of electrofishing equipment shall conform to WSDOT *Fish Exclusion Protocols and Standards* (WSDOT 2009), and guidelines outlined by the NMFS (NMFS 2000b).

5. The FHWA shall document and report all bull trout encountered during fish capture and handling operations. The FHWA shall submit a monitoring report to the Washington Fish and Wildlife Office in Lacey, Washington (Attn: Transportation Planning Branch), within 30 days of the fish capture and handling operations associated with each casting basin gate opening.

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

1. The FHWA shall monitor turbidity levels in Portage Bay, Union Bay, and Lake Washington during sediment-generating activities. Monitoring shall be conducted at a distance of 150 ft from sediment-generating activities.

2. Monitoring shall be conducted at 30-minute intervals from the start of sediment generating activities. If turbidities measured over the course of three consecutive 30-minute sample intervals do not exceed 9 NTUs over background, then monitoring of sediment-generating activities will be conducted for the remainder of the workday at a frequency of once every 6 hours, or if there is a visually appreciable increase in turbidity.

3. If, at any time, monitoring conducted 150 ft from sediment-generating activities indicates turbidity in excess of 9 NTUs over background, then monitoring shall instead be conducted at 300 ft from sediment-generating activities. Monitoring shall be conducted at 30-minute intervals until turbidity falls below 9 NTUs over background.

4. If turbidity levels measured at 300 ft from the sediment-generating activity exceed 84 NTUs above background at any time, 40 NTUs above background for more than 1 hour continuously, or 18 NTUs above background for more than 3 hours, cumulatively, over a 18-hour workday, then the amount of take authorized by the ITS will have been exceeded. Sediment-generating activities shall cease, and the FHWA shall contact a consulting biologist with the Transportation Planning Branch at the Washington Fish and Wildlife Office in Lacey, Washington (360-753-9440) within 24 hours.

5. Monitoring shall be conducted to establish background turbidity levels away from the influence of sediment-generating activities. Background turbidity shall be monitored at least twice daily during sediment-generating activities. In the event of a visually appreciable change in background turbidity, an additional sample shall be taken.

6. If, in cooperation with other permit authorities, the FHWA develops 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 Service for review and approval in lieu of the above monitoring requirements. The strategy must be submitted to the Service 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.

7. The FHWA shall submit a monitoring report to the Washington Fish and Wildlife Office in Lacey, Washington (Attn: Transportation Planning Branch), by August 1 following each construction season. The report shall include, at a minimum, the following: (a) dates, times,

and locations of construction activities, (b) monitoring results, sample times, locations, and measured turbidities (in NTUs), (c) summary of construction activities and measured turbidities associated with those activities, and (d) summary of corrective actions taken to reduce turbidity.

8. The FHWA shall also copy the Service with any water or sediment quality monitoring data or reports submitted to the Washington State Department of Ecology in satisfaction of related permits. This shall include any water or sediment quality monitoring data collected when constructing mitigation components elsewhere in the Lake Washington watershed (e.g., Cedar River, tributary to Lake Washington; Bear Creek, tributary to Sammamish River; etc.).

The following terms and conditions are required for the implementation of RPM 3:

1. The FHWA shall use a vibratory pile hammer to the fullest extent practicable when installing steel piles below the OHWM.

2. The FHWA shall monitor in-water sound generation and attenuation while installing steel piles with an impact pile hammer and during hoe ram operation.

3. The FHWA shall conduct a performance test of the noise attenuation device, prior to any impact pile driving or proofing. The performance test shall confirm calculated pressures and flow rates at each manifold ring.

4. The FHWA shall ensure that a qualified individual is present during all impact pile driving and proofing operations, and during operation of the hoe ram, to observe and report any indications of dead, injured, or distressed fish.

5. The FHWA shall document the effectiveness of the noise attenuation device with hydroacoustic monitoring in Portage Bay and Union Bay (west of Foster island), in Union Bay (east of Foster Island), and, along the east approach. In each of these three areas, the FHWA will perform both routine monitoring and, as necessary, contingency monitoring.

    a. Routine monitoring will document effectiveness of the noise attenuation device and resulting peak sound levels for:

        i. A minimum of five steel piling installed during the initial pile driving activity in each of the three areas; and,

        ii. A minimum of five additional steel piling installed at the mid-point of the piling installation schedule for Portage Bay and Union Bay (west of Foster island); and,

        iii. A minimum of five additional steel piling installed at both the mid-point and near completion of the piling installation schedule (10 piles in total) for Union Bay (east of Foster Island); and,

iv. A minimum of five additional steel piling installed at both the mid-point and near completion of the piling installation schedule (10 piles in total) for the east approach.

b. If the pile strike count for four consecutive piles exceeds by 50 percent or more the maximum single pile strike count observed when performing routine monitoring in that area, this shall be indicative of changed pile driving characteristics. The FHWA shall cease pile driving and not restart except with implementation of contingency hydroacoustic monitoring.

c. In each instance of changed pile driving characteristics, contingency hydroacoustic monitoring will document effectiveness of the noise attenuation device and resulting peak sound levels for the next five steel piling.

d. Factors to consider in identifying the piles to be monitored include, but are not limited to bathymetry of the project site, total number of piles to be impact driven and proofed, depth of water, and distance from shore. This monitoring shall document recorded SPLs, and single strike and cumulative SELs, monitored at a distance of 10 meters from the pile at mid-water depth.

6. The FHWA shall contact the Service within 24 hours if the hydroacoustic monitoring indicates that the sound levels will exceed the extent of take exempted in the Biological Opinion. The FHWA shall also contact the Service within 24 hours if they determine that unattenuated pile strikes are necessary to determine baseline sound levels or evaluate effectiveness of the noise attenuation device at locations other than the east approach. The FHWA shall consult with the Service regarding modifications to the proposed action in an effort to reduce the sound levels below the limits of take and continue hydroacoustic monitoring.

7. The FHWA shall submit a monitoring report to the Washington Fish and Wildlife Office in Lacey, Washington (Attn: Transportation Planning Branch), by August 1 following each construction season. The report shall include the following information:

a. Size and type of piles driven and proofed, or a description of hoe ram operations;

b. The impact hammer force used to drive and proof piles;

c. A description of the monitoring equipment;

d. The distance between hydrophone and pile;

e. The depth of the hydrophone;

f. The distance from the pile to the wetted perimeter;

g. The depth of water;

h. The depth into the substrate the pile was driven and proofed;

i. The physical characteristics of the bottom substrate into which the piles were driven and proofed; and

j. The results of the hydroacoustic monitoring, including the frequency spectrum, SPLs, and single-strike and cumulative SEL. The report must also include the ranges and means for peak, RMS, and SELs.

The following terms and conditions are required for the implementation of RPM 4:

1. The FHWA shall implement the programmatic approach to stormwater quality monitoring (Programmatic Monitoring Approach for Highway Stormwater Runoff in Support of the Act Section 7 Consultation, dated June 2009). The WSDOT shall accurately characterize stormwater best management practice (BMP) effectiveness and end-of-pipe effluent discharge concentrations for treated and untreated stormwater runoff (total and dissolved copper; total and dissolved zinc; total suspended solids). Sampling, data collection, analysis, and reporting (including quality control/quality assurance procedures) shall follow requirements from the WSDOT's Municipal Stormwater NPDES (National Pollutant Discharge Elimination System) and State Waste Discharge General Permit. Data and conclusions derived through this programmatic monitoring approach are broadly representative of conditions within the action area, including average daily traffic and temporal variations in stormwater runoff quantity and quality.

2. If the programmatic monitoring results suggest that the analyses included in this Opinion may have underestimated end-of-pipe effluent discharge concentrations or the size of resulting dilution zones, then the FHWA and the Service shall consider jointly any potential change(s) to exposure and effects in listed species and/or their critical habitat, and the need for reinitiation of consultation.

3. If the final, approved stormwater design(s) differ from the design described in this Opinion, then the FHWA shall evaluate potential changes in stormwater pollutant loadings and concentrations. The FHWA shall provide to the Service a description of the design change(s) and a corrected version of the stormwater model analyses. If predicted pollutant loadings, concentrations, or resulting dilution zones exceed those described in this Opinion, the FHWA and the Service shall consider jointly any potential change(s) to exposure and effects, and the need for reinitiation of consultation.

4. The FHWA shall design and build the MOHAI enhanced stormwater treatment facility with a well-integrated stormwater quality monitoring capability. The MOHAI facility shall incorporate design features that facilitate accurate characterization of stormwater BMP effectiveness and end-of-pipe effluent discharge concentrations for treated stormwater runoff (total and dissolved copper, total and dissolved zinc, and total suspended solids).

5. The FHWA shall provide to the Service a copy of the approved site-specific monitoring and reporting plan for the conditionally-approved "all known, available and reasonable methods of prevention, control and treatment" (AKART) enhanced treatment method on the floating bridge span. The FHWA shall also provide a courtesy copy of any required monitoring reports or other documentation submitted to the Washington State Department of Ecology in support and validation of the AKART treatment method. The FHWA shall provide notice to the Service in advance of any plan to deviate from specific elements of the conditionally-approved AKART method (i.e., monthly high-efficiency sweeping and twice-annual catch basin cleaning).

6. The FHWA shall provide to the Service a courtesy copy of any permit application(s), monitoring data, or other documentation provided to the City of Seattle in support of compliance with applicable combined sewer overflow discharge requirements.

7. The FHWA shall submit all documentation in writing to the Washington Fish and Wildlife Office in Lacey, Washington (Attn: Transportation Planning Branch).

The following terms and conditions are required for the implementation of RPM 5:

1. The FHWA shall visually monitor for turbidity and/or sediment disturbance whenever conducting barge and tugboat operations in support of the project along the Kenmore Navigation Channel.

2. The FHWA shall not conduct barge and tugboat operations along the Kenmore Navigation Channel at night, unless earlier monitoring has established no significant sediment disturbance or visible turbidity beyond specified limits, or unless corrective actions have been taken.

3. The FHWA shall establish and use temporary anchorage in Lake Washington to reduce the number of vessels, and thereby limit the number of active propellers, in the channel at one time.

4. The FHWA shall operate vessels at speeds of 5 knots or below when in the channel, and restrict extended reverse movements.

5. The FHWA shall use navigation/global positioning system (GPS) equipment, operate in the deepest portions of the channel, and record position and heading.

6. The FHWA shall minimize fuel loads, as practicable, to reduce tugboat draft.

7. If, at any time, visual monitoring detects turbidity and/or sediment disturbance extending more than 300 feet from the source (i.e., the barge and/or tugboat), or a visible plume persisting for more than 1 hour (per event) regardless of physical extent, the FHWA shall take immediate corrective action. The FHWA shall not initiate new trips along the Kenmore

Navigation Channel unless and until corrective action is in-place. In the event that these same or similar conditions cannot be avoided with ensuing trips, the FHWA shall provide notice to the Service within 24 hours (Attn: Transportation Planning Branch at the Washington Fish and Wildlife Office, Lacey, Washington).

8. The FHWA shall document, and compile and submit to the Service records describing barge and tugboat operations in support of the project along the Kenmore Navigation Channel. The FHWA shall submit an annual report to the Service each calendar year, by March 31 of the following year. The annual report shall include, at a minimum: (1) date and time of individual trips along the Kenmore Navigation Channel; (2) data sheets for individual trips, recording weather conditions, visual signs of ambient turbidity, and observer notes describing any turbidity and/or sediment disturbance resulting from barge and tugboat operations in support of the project; and, (3) a summary of any trips or events requiring corrective action, per Condition 7 (above), and the corresponding actions taken by the FHWA to reduce turbidity and/or sediment disturbance.

9. All notifications and submittals shall be made to the Transportation Planning Branch at the Washington Fish and Wildlife Office, Lacey, Washington.

We expect that the amount or extent of incidental take described above will not be exceeded 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. FHWA must provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service 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 U.S. Fish and Wildlife Service 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 U.S. Fish and Wildlife Service Law Enforcement Office at (425) 883-8122, or the Service's Washington Fish and Wildlife Office at (360) 753-9440.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act 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 Service recommends the following to the FHWA:

1. The FHWA should further evaluate the potential stormwater quality benefits of a program of high-efficiency sweeping performed between the west approach high-rise and Montlake Interchange. Long stretches of the Portage and Union Bay bridges and approaches have been designed to convey surface runoff to land-based stormwater treatment facilities for treatment and discharge. However, under conditions exceeding the storm design event, stormwater runoff originating from the Portage and Union Bay bridges and approaches will release through scuppers and direct discharge to the adjacent waters without treatment. High-efficiency sweeping performed at strategic times of year (i.e., after prolonged periods without precipitation, and before the next significant storm event) may provide measurable stormwater quality benefits.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR section 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 if: (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.