United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

APR 29 2015

In Reply Refer To:
13410-2011-F-0063-R005
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

Daniel M. Mathis
Division Administrator
Federal Highway Administration
Evergreen Plaza Building
Olympia, Washington 98501-1284

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 HOV 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 October 22, 2014, the FHWA requested a fifth re-initiation of formal consultation on the Project in order to update the underwater noise effects of impact pile driving based on monitoring results from the West Connection Bridge (WCB) construction, update 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, request a change to the due date of monitoring reports, and address other project updates. On March 19, 2015, we received another

request to amend the in-water impact pile driving work window. 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. This formal re-initiation 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 first design-build phase of the project (Floating Bridge and Landings), and requesting reinitiation of formal consultation. On January 10, 2012, the Service responded with a reinitiation 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 Reasonable and Prudent Measures (RPMs), and implementing Terms and Conditions (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 reinitiation letter (XRef: 13410-2011-F-0063-R002**)** that amended the original Opinion and ITS. The Service determined that the requested work window extension will result in a change to the timing of the proposed work, but 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 deemed necessary.

On November 28, 2012, the FHWA again requested reinitiation of formal consultation for two additional design and construction changes:

- Use of barges, temporary mooring dolphins, and anchors for the purpose of staging construction along, and to the north of, the new floating bridge alignment and existing west approach (Westside Overwater Staging Area); and

- Additional temporary structures, work trestles or platforms and drilled shaft templates, needed for construction of the temporary WCB between the new floating bridge alignment and existing west approach (WCB).

On January 3, 2013, the Service responded with a reinitiation letter (XRef: 13410-2011-F-0063-R003) concluding that the identified design and construction 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, RPMs, and implementing T&Cs remained unchanged.

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

Modifications to the Action

We based our original sound analysis for impact pile driving in this area on the results from the SR 520 Pile Installation Test Program. During the in-water work period between October 8, 2013 and April 15, 2014, the FHWA and WSDOT monitored underwater sound levels during the installation of 28 piles during the WCB construction. Due to different geologic conditions, the extent of effects from elevated underwater sound exceeded the predicted levels and a greater area of Lake Washington was ensonified by injurious levels of underwater sound (Table 1).

Table 1. Comparison of Predicted and Observed Underwater Sound Pressure Levels (SPLs) during WCB construction (FHWA 2014a).

	dB PEAK	**Single Strike dB SEL**	**dB RMS**
Predicted Underwater Sound	178	157	166
Measured Underwater Sound	188	166	177

SEL - Sound Exposure Levels

We established in our original opinion that subadult and adult bull trout exposed to an accumulated SEL of 187 dB would be injured or killed and that subadult and adult bull trout, when exposed to single-strike SPLs of 150 dB_{RMS} or above will experience a significant disruption of their normal behaviors. Using the practical spreading model and the predicted noise levels, we calculated the distance from the pile that sound would remain at or above the 187 dB_{cSEL} and 150 dB_{RMS} thresholds. Using these distances, we also calculated the total area exposed to the elevated SPLs. Following the same methodology, we recalculated these numbers using the measured sound levels in place of the predicted values (Tables 2 and 3).

Table 2. Comparison of predicted and measured extents of exposure to elevated SPLs for bull trout during WCB construction (FHWA 2014b).

Calculated Distances and Areas	**187 dB_{cSEL} Distance from Pile (feet)**	**187 dB_{cSEL} Area (acres)**	**150 dB_{RMS} Distance from Pile (feet)**	**150 dB_{RMS} Area (acres)**
Using Predicted Data	62	4.0	450	42.8
Using Measured Data	384	13.4	2070	356.6

The extent of exposure to elevated underwater sound for the WABN phase of the project was recalculated using the measured data from the WCB. Given the overlap in the area of the two phases, we determined the WCB monitoring data would be a better predictor of the underwater sound for WABN than the original test pile data.

Table 3. Comparison of predicted and re-calculated extents of exposure to elevated SPLs for bull trout during WCB construction.

Calculated Distances and Areas	**187 dB_{cSEL} Distance from Pile (feet)**	**187 dB_{cSEL} Area (acres)**	**150 dB_{RMS} Distance from Pile (feet)**	**150 dB_{RMS} Area (acres)**
Using Predicted Data (West Approach)	62	3.8	450	42.8
Using Measured Data (West Approach)	384	13.4	2070	356.6
Using Predicted Data (Union Bay)	6.5	1.3	72	9.7
Using Measured Data (Union Bay)	581	30.7	2070	122.3

In addition to the physical extent, the temporal extent of effects will also be increased extended. WSDOT's contractor, Flatiron Construction, is behind schedule. WSDOT will now drive 12 piles west of Foster Island and due south of Marsh Island between May 1 and May 31, 2015. Adult and subadult bull trout may occupy this area at any time of year. Figure 1 shows the physical extent of underwater noise from the impact driving of these 12 piles. The delay in driving these piles is extremely unlikely to result in additional take.

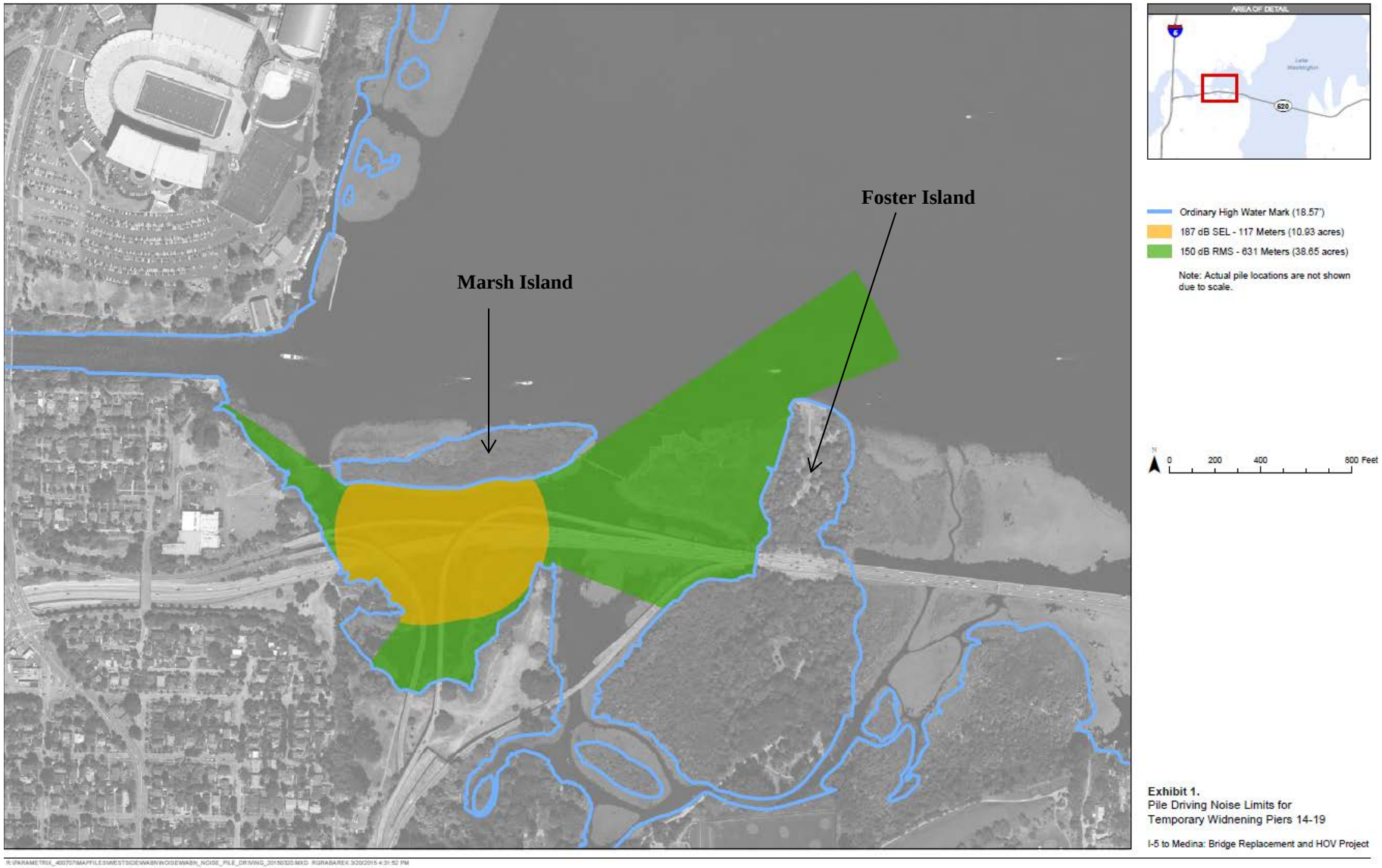

Figure 1. Extent of underwater sound from driving of steel piles between May 1 and May 31, 2015.

All work, with the exception of the 12 piles described above, will comply with the established in-water work window for the west approach to Lake Washington (east of Foster Island) and Salmonid Habitat Function Zone 6 (August 1 to April 30; October 1 to April 15 for impact pile driving and proofing), and the FHWA, WSDOT, and their Contractors will fully implement all conservation measures, RPMs, and T&Cs that are included in the Service's Opinion. Where these relate to pile driving, they include the following (Opinion, pp. 17, 122-124):

- The project will use a vibratory hammer when installing steel piles to the fullest extent practicable. Except for the purpose of proofing piles and determining load-bearing capacity, the project will not resort to use of an impact hammer(s) unless and until site conditions are encountered that prevent effective use of a vibratory hammer(s).

- When impact driving and proofing steel piles, the project will implement a bubble curtain noise attenuation device. The bubble curtain shall meet all design and performance criteria outlined in specifications (Opinion, Appendix A).

- The FHWA shall conduct a performance test of the noise attenuation device, prior to any impact pile driving or proofing.

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

- The FHWA shall document the effectiveness of the noise attenuation device with hydroacoustic monitoring …will perform both routine monitoring and, as necessary, contingency monitoring.

- 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 Opinion …shall submit a monitoring report … following each construction season.

Summary of Changes in the Action

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

The changes summarized above increase the area that bull trout will be exposed to temporary elevated underwater sound. The area ensonified with SPLs sufficient to cause injury or death to bull trout will increase from 3.8 to 13.4 acres and the area ensonified by SPLs sufficient to cause behavioral effects to bull trout will increase from 42.8 to 356.6 acres. However, bull trout occur in the Lake Washington watershed infrequently and in low to very low numbers. It is therefore unlikely that the total number of exposed and affected individuals will increase substantially. The minimization measures summarized above will avoid and further minimize potential *permanent* effects to bull trout and designated bull trout critical habitat.

In addition to addressing these project changes, we are also changing the due date of the required monitoring reports. The original RPM 2, T&C 7 and RPM 3, T&C 7 required WSDOT to submit water quality and underwater sound monitoring reports by April 15 of each construction season. However, in-water construction and monitoring may occur as late as May 15 (depending on the activity and location). Therefore, we are revising the due date for the water quality and underwater sound monitoring reports to August 1 following each construction season.

Jeopardy and Adverse Modification Determinations

This letter addresses design and construction changes for the WABN contract and construction phase. These changes will increase the extent of exposure of bull trout to adverse temporary effects from elevated underwater sound.

We expect these project modifications as described above to result in temporary 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 area of exposure to this stressor has increased, we do not expect a measurably greater number of bull trout to be exposed to the stressor than was analyzed in the Opinion. We still expect the number of bull trout killed or 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). Because these few individuals originate from any of the fifteen (or more) local populations, we expect that no measurable effects to number (abundance) will be evident at the scale of the local population or core areas. The anticipated permanent and temporary effects will not measureable 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 Primary Constituent Elements (PCEs). 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 PCEs of critical habitat as described in the Opinion from being maintained, and will not degrade the current ability to establish functioning PCEs 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), Puget Sound interim recovery unit, and coterminous range.

However, the action, as now proposed, and the conclusions reached here are not expected to 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 design and construction 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 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 to address changes to the spatial and temporal extent of foreseeable effects to the bull trout and designated bull trout critical habitat, including changes to the extent of temporary effects from elevated underwater sound that result in take and a modification of T&C 7 to implement RPM 3. The enclosed Incidental Take Statement reflects comprehensively the current and previous revisions to quantified incidental take, including those issued on July 27, 2012 (FWS Ref. No. 13410-2011-F-0063-R002) and replaces previous versions.

The RPMs and implementing T&Cs 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 T&Cs, or (2) fails to require the Contractor or applicant to adhere to the T&Cs, the protective coverage of section 7(o)(2) may lapse. In order to monitor incidental take, the FHWA must report to the Service the progress of the action and its effects, as specified in the ITS [50 CFR section 402.14(i)(3)].

With the issuance of our amended ITS, this letter concludes reinitiated formal consultation on the Project. If you have any questions about this letter or our shared responsibilities under the Act, please contact Mark Miller at (360) 534-9347, of my staff.

Sincerely,

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

Enclosure(s)

cc:
WSDOT, Seattle, WA (M. Meade)
NMFS, Seattle, WA (M. Grady)
USFWS, Lacey, WA (M. Miller)

Literature and Sources

Federal Highway Administration. 2014a. Letter to Mr. Ken Berg (October 17, 2014) and Memorandum (ESA Reinitiation Memorandum – West Approach Bridge Project Updates). Washington Division, Olympia, Washington. 93pp. (with attachments).

Federal Highway Administration. 2014b. Letter to Mr. Ken Berg (December 31, 2014) and Memorandum (ESA Reinitiation Memorandum – West Approach Bridge Project Addendum). Washington Division, Olympia, Washington. 68pp.

U.S. Fish and Wildlife Service. 2011. Biological Opinion – State Route 520, Interstate-5 to Medina Bridge Replacement and HOV Project (FWS Ref. No. 13410-2011-F-0063; April 15, 2011). Washington Fish and Wildlife Office, Lacey, Washington. 225pp.

U.S. Fish and Wildlife Service. 2012a. Letter to Daniel M. Mathis, Washington Division Administrator (FWS Ref. No. 13410-2011-F-0063-R001; January 10, 2012). Washington Fish and Wildlife Office, Lacey, Washington. 8pp.

U.S. Fish and Wildlife Service. 2012b. Letter to Daniel M. Mathis, Washington Division Administrator (FWS Ref. No. 13410-2011-F-0063-R002; July 27, 2012). Washington Fish and Wildlife Office, Lacey, Washington. 5pp.

U.S. Fish and Wildlife Service. 2013. Letter to Daniel M. Mathis, Washington Division Administrator (FWS Ref. No. 13410-2011-F-0063-R003; January 3, 2013). Washington Fish and Wildlife Office, Lacey, Washington. 6pp.

Washington State Department of Transportation. 2010. Biological Assessment – SR 520, I-5 to Medina: Bridge Replacement and HOV Project. Prepared for WSDOT by Confluence Environmental Company, HDR, and Parametrix, Inc. November 2010. 785pp.

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 April 29, 2015

Section 9 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.) (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.

The measures described below are non-discretionary, and must be undertaken by the Federal Highway Administration (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 incidental take statement. 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 incidental take statement 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 incidental take statement [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 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 ordinary high water mark (OHWM) of Portage Bay, Union Bay, and Lake Washington. Take will result when levels of turbidity reach or exceed the following:

   i) 84 Nephelometric Turbidity Units (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; or

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

   - 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; 2013-2018), 1,600 working days (Lake Washington – West Approach; August 1 - April 30, 2013-2018), and 1,200 working days (Lake Washington – East Approach; July 1 - May 15, 2012-2015), 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 sound pressure level (SPL)s 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 impact pile driving and proofing of approximately 1,200 steel piles along the west approach to Lake Washington (east of Foster Island), between October 8, 2013, and April 15, 2014, between October 8, 2014, and April 15, 2015, and between October 8, 2017, and April 15, 2018 (approximately 570 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; 13.4 acres during 2014-15, and 7.7 acres during 2017-18) will be harmed.

6. 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.

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 1,200 steel piles along the west approach to Lake Washington (east of Foster Island), between October 8, 2013, and April 15, 2014, between October 8, 2014, and April 15, 2015, and between October 8, 2017, and April 15, 2018 (approximately 570 working days in total).

   - All adult or subadult bull trout within approximately 2070 ft of piling installation operations in Lake Washington (356.6 acres during 2013-14; 356.6 acres during 2014-15, and 39.2 acres during 2017-18) 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 impact pile driving and proofing of approximately 1,088 steel piles in Union Bay, between September 1, 2014, and April 30, 2015, and between September 1, 2017, and April 30, 2018 (approximately 500 working days in total).

    - All adult or subadult bull trout within approximately 2,070 ft of piling installation operations in Union Bay (122.3 acres during 2014-15; 10.0 acres during 2017-18) 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 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.

10. 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.

11. 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 Cu concentrations exceed the sub-lethal neurotoxic threshold of an increase of 2 μg/L over background, or when dissolved Zn concentrations exceed 5.6 μg/L over background.

    - All adult or subadult bull trout within 20 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.

12. 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 Biological Opinion (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 or Terms and Conditions.

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.

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 Washington State Department of Transportation (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 Incidental Take Statement 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.

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 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 Sound Exposure Levels (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;

    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 Practices (BMP) effectiveness and end-of-pipe effluent discharge concentrations for treated and untreated stormwater runoff (total and dissolved Cu; total and dissolved Zn; 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 Technologies (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 T&Cs 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/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.