UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
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April 23, 2024

Todd N. Tillinger, P.E.
Chief, Regulatory Branch
Seattle District, U.S. Army Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-3755

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Lake Entiat Lodge Association Dock Replacement, Columbia River, Douglas County, Washington.

Dear Mr. Tillinger:

This letter responds to your November 16, 2023, request for initiation of consultation with National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA) for the subject action. Your request, including information submitted subsequent to that request, qualified for our expedited review and analysis because it met our screening criteria and contained all required information on, and analysis of, your proposed action and its potential effects to listed species and designated critical habitat.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act (6 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of Pacific coast salmon. Therefore, we have included the results of that review in this document.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the biological opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

The U.S. Army Corps of Engineers (Corps) submitted a consultation initiation package to NMFS on November 16, 2023, including a Biological Assessment (BA) prepared by Grette Associates (Grette) for the Lake Entiat Lodge Association. The Corps and Grette concluded that the proposed action was likely to adversely affect Upper Columbia River (UCR) spring-run Chinook salmon (*Oncorhynchus tshawytscha*) and UCR steelhead (*O. mykiss*), and their critical habitat. We reviewed the initiation package and sent an email to the Corps on December 6, 2023, requesting additional information on the barge, work area isolation, pile driving, staging, and riparian plantings. The response to the additional information request was received on December 13, 2023, and consultation was initiated on this date.

Where relevant, we have adopted the information and analyses you and Grette have provided and/or referenced but only after our independent, science-based evaluation confirmed they meet our regulatory and scientific standards. We adopt by reference the following sections of the BA (Corps 2023): Section 2, Project Description (pp 2–12); Section 3, Description of the Project Area (pp. 13–19); Section 4, Description of Species and Habitat Use (pp. 20–21); Section 5, Effects of the Project (pp. 24–31); Section 6, Critical Habitat Evaluation (pp. 32–37); Section 7, Conservation Measures Related to the Species (pp. 38–39); Section 8, Conclusions and Determinations (pp. 40-41); and Section 9, Essential Fish Habitat Assessment (pp. 42-44).

As described in the BA, the Corps proposes to authorize Lake Entiat Lodge Association to: (1) remove all docks and concrete floats from the middle embayment (6,332 square feet), and install a reconfigured dock (7,396 square feet) with a fully grated float system; (2) remove, but not replace, the dock and float in the upriver embayment (1,349 square feet); (3) remove the dock and three wooden floats (2,788 square feet) in the lower embayment, and install three new floats of roughly the same size (3,018 square feet); (4) remove existing access trails (325 square feet) and replace with lawn grass; and (5) establish a new access trail (250 square feet). Overall, the proposed project would result in the removal of 10,469 square feet of overwater coverage, and 33 steel piles (15.53 square feet). It will also result in the installation of 10,414 square feet of overwater coverage, and 37 8-inch steel piles coated with white epoxy or placed in a white PVC sleeve (8.6-inch outer diameter, 15.2 square feet). The piles will be removed using either a barge mounted vibratory hammer or a barge mounted loader. All removed floats and piles will be towed by a modified pontoon boat to the boat launch in the lower embayment, removed from the river using an excavator, and disposed of at an appropriate upland disposal site. All steel pipe pile will be installed using a barge mounted vibratory or impact pile driver, and fitted with anti-perching caps. A contractor will implement the project using ground-based and barge-based equipment and hand power tools. The project will occur over two to three Columbia River in-water work windows (July 16–February 28). All pile driving will occur in the shortened work window of October 1–February 28.

We considered, under the ESA, whether or not the proposed action will cause any other activities and determined that it will not. The Lake Entiat Lodge Association would continue to use and maintain the private boat launch. The site currently experiences heavy use of the three embayments by the residents in 440 residential parcels. Upon completion, the site will not experience any increase in use, as the docks will still only be accessible by residents of the 440 residential parcels.

We examined the status of UCR spring-run Chinook salmon and UCR steelhead, the species which would be adversely affected by the proposed action, to inform the description of the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. We also examined the condition of critical habitat throughout the designated area and discuss the function of the physical or biological features essential to the conservation of the species that create the conservation value of that habitat. Section 3.4 (Definition of the Reach) and Section 4 (Description of Species and Habitat Use) of the BA include descriptions of the species and critical habitat in the action area, which is adopted here. NMFS' status of the species summaries for each of the salmon and steelhead species that may be impacted by the proposed action are available on the NOAA Fisheries website at https://www.fisheries.noaa.gov/west-coast/consultations/esa-section-7-consultations-west-coast, and incorporated by reference. NMFS also incorporates by reference the most recent 5-year review of the species status (NMFS 2022).

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area includes the project area (three embayments; existing and newly constructed docks, floats, and trails; and staging and work areas), extending 300 feet downstream from the lower embayment in the Columbia River, which is the extent of anticipated turbidity plumes from towing removed docks and floats to the boat ramp.

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02). The environmental baseline, and species and habitat use, are described in Sections 3.4 and 4 of the BA, respectively, and adopted here. The action area is in an impounded section of the Columbia River (Lake Entiat). The action area consists of five community docs and handling floats owned by the Lake Entiat Lodge Association and located in three large embayments off the mainstem of the Columbia River. The Lake Entiat Lodge Association owns approximately 0.43 miles of shoreline, and nearly the entire shoreline has been graded and developed for community access. The dredging of the three embayments resulted in the armoring of the peninsula fingers between the embayments. The action area also includes altered habitats and flow regimes caused by Columbia River hydrosystem development, that creates more favorable habitat conditions for invasive, non-native species that may compete with or prey upon juvenile salmonids.

The Columbia River in the action area is designated critical habitat, and supports rearing and migration of fish from the Methow River population of UCR spring-run Chinook salmon, and the Okanogan and Methow River populations of UCR steelhead. The action area provides physical and biological features (PBFs) of critical habitat for rearing and migration, though these persist in a largely degraded condition. The ability of critical habitat in the action area to support

recovery of UCR spring-run Chinook salmon and UCR steelhead is primarily limited by impacts of hydropower development and operation.

Project Effects

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

An assessment of the effects of the proposed action is provided in Sections 5 and 6 of the BA, and additional submitted information, and adopted here (50 CFR 402.14(h)(3)). Within the action area, rearing of juvenile UCR spring-run Chinook salmon and UCR steelhead occurs year-round. Juvenile migration downstream can occur year-round, with most occurring May through July. Adult migration of UCR spring-run Chinook salmon occurs March through July. Adult migration of UCR steelhead occurs year-round, and peaks August through September. Because in-water work will occur July 16 through February 28, with all pile driving occurring between October 1 and February 28, the project avoids peak downstream migration of juveniles from both species, and peak upstream migration of adult UCR spring-run Chinook salmon. Pile driving also avoids peak upstream migration of adult UCR steelhead. However, some in-water project activities will occur during the peak adult UCR steelhead migration. Therefore, NMFS expects a small number of juvenile and adult UCR spring-run Chinook salmon and a small number of juvenile UCR steelhead, will be present in the action area during the project. However, we expect several adult UCR steelhead will be present during in-water work occurring prior to October 1.

The only potential adverse project effects to UCR spring-run Chinook salmon and UCR steelhead identified by the Corps and Grette is minor behavioral disturbance of juvenile salmon and steelhead within 82 feet of piles being driven with an impact pile driver.

The Corps and Grette do not identify any adverse effects to critical habitat. Potential positive effects to PBFs identified by the Corps and Grette include:

- Decreased shading from replacing solid decked docks and floats with grated docks and floats.
- An overall reduction of 55 square feet of overwater coverage.

The Corps and Grette determined that overall, the proposed project would result in an improvement in habitat condition due to the overall reduction in overwater coverage compared to the existing conditions.

NMFS has evaluated the effects sections in the BA and additional submitted information, and after our independent, science-based evaluation, determined that the additional information provided below is needed to complete our analysis.

Effects to Species

Pile Driving

We expect a small number of juvenile UCR spring-run Chinook salmon and a small number of UCR adult and juvenile steelhead will be present in the action area during pile driving; all will be larger than 2 grams. We also expect juvenile salmon and steelhead will be using the embayments for rearing and feeding. However, because of shallow, low velocity water in the embayments, and the barge and boating activity associated with project construction, we do not expect any adults to be present in the embayments. Because of the presence of juvenile salmon and steelhead and adult steelhead in the action area, NMFS conducted an independent analysis of pile driving effects using our vibratory and impact pile driver calculators and the Fisheries Hydroacoustic Working Group (FHWG) criteria. The FHWG, a multi-agency work group, identified criteria to define sound pressure levels (SPL) where effects to fish are likely to occur from pile driving activities (FHWG 2008). The FHWG determined:

- Instant injury or death can occur from a single strike if peak level is at or above 206 decibels re: 1 μPa (dB).
- Injury to fish larger than 2 grams occurs at 187 dB sound exposure level (SEL), for cumulative strikes.
- "Harassment" threshold is 150 dB, where behavioral effects or potential physical injury (i.e., harm) to individual salmon or steelhead within a distance of the source may occur.

Vibratory pile driving. Thirty-seven 8-inch-diameter steel piles will be installed using a vibratory hammer. Approximately 24 piles will be installed in year 1, and up to 13 will be installed in year 2 or 3. A maximum of 6 piles will be installed per day. Therefore, we expect installation will take 4 days in year 1, and 3 days in year 2 or 3. Using the NMFS vibratory calculator, vibratory pile driving proxy sound levels for 12-inch steel pile (the next largest pile size of the same material with recorded SPL data based on similar projects in CalTrans 2015 and 2020), and information provided in the BA, we estimate the behavioral threshold of 150 dB will be exceeded up to 72 feet from 8-inch-diameter steel piles installed by vibratory pile driving (Table 1). We expect varying levels of behavioral responses from salmon and steelhead exposed to SPLs above 150 dB. These responses range from no change, to mild awareness, to a startle response (Hastings and Popper 2005). Based on the location of pile driving, we expect 150 dB will not be exceeded outside the three embayments. We also expect only juvenile salmon and steelhead will be located in the embayments, and for most to move short distances away from the sound without physical injury. These relocations will not affect growth since terrestrial macroinvertebrates and invertebrate drift will maintain a source of forage. However, refuge habitat is not available within the embayments. Therefore, juvenile fish that flee will experience increased risk of predation from avoiding elevated SPLs. Vibratory pile driving will occur when rearing juvenile UCR spring-run Chinook salmon and juvenile UCR steelhead could be in the project area in small numbers. Therefore, we expect a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead within 72 feet of 8-inch-diameter steel piles to alter their behavior during vibratory pile driving, increasing their risk of predation for up to 4 days in year 1, and up to 3 days in year 2 or 3. Because adults will not be in the embayments, and

elevated sound levels from vibratory pile driving will not extend beyond the embayments, we do not expect any effects to adult UCR steelhead from vibratory pile driving.

Impact pile driving. Impact pile driving will only occur if refusal is encountered during vibratory pile driving prior to adequate pile depth. In their analysis (BA pp. 24–26, and incorporated by reference), Grette analyzed the effects of impact pile driving using hydroacoustic data from similar projects (CalTrans 2015) and NMFS' impact pile driving calculator. Grette assumed a 9-dB sound reduction by using a wood block for noise attenuation. Because data on underwater SPLs of driving 8-inch-diameter piles is not available, Grette used available data for 12-inch steel pile, the next largest pile size with recorded SPL data. Grette used the lowest recorded data for 12-inch piles installed using a gravity-powered drop hammer (e.g., Sausalito Dock: 177 dBpeak, 165 dBRMS, and 152 dBSEL).

NMFS conducted an independent analysis of pile driving effects and used the same data for 12-inch piles (CalTrans 2020). However, NMFS determined that a 5-decibel sound attenuation due to the use of a wood block was more appropriate based on analyses in CalTrans (2020). Expected sound pressure levels based on information submitted in the BA and in CalTrans (2020), and with a 5-dB noise attenuation, are included in Table 1. These data assume measurement occurs at 10 meters (33 feet), a default transmission loss constant of 15 meters (49 feet), and a minimum of a 5-dB reduction in underwater sound levels at 10 meters (33 feet) from use of the sound attenuation device.

Table 1. Estimated distance to onset of behavioral changes or physical injury for salmon and steelhead greater than 2 grams near the Lake Entiat Lodge Association Dock Replacement project in the Columbia River. Estimated distance is based on a steel pile size of 12 inches, maximum number of piles driven per day, maximum number of pile strikes per day, and a 5 decibel (dB) sound reduction during impact pile driving from use of a wood block. Peak, single strike sound exposure level (SEL), and root mean square (RMS) decibels (dB) are from Table I.2-1a in CalTrans (2020). Distance to threshold was estimated using the National Marine Fisheries Service's vibratory and hydroacoustic calculators.

Number of Piles per Day	Installation Method	Maximum Strikes per Day	Peak (dB)	Single Strike SEL (dB)	RMS (dB)	Cumulative SEL	Distance (feet) to Threshold		
							Onset of Physical Injury		
							Peak	Cumulative SEL	Behavior
6	Vibratory		--	--	155	--	--	--	72
6	Impact	1,146	172	147	160	178	0	6.6	151

We expect a small number of juvenile UCR spring-run Chinook salmon and a small number of adult and juvenile UCR steelhead will be present in the action area during impact pile driving, and all to be greater than 2 grams. We expect that use of the vibratory hammer to start each pile will have caused most juvenile salmon and steelhead to move short distances away from the sound. Because of the location of pile installation near the middle embayment inlet and the approximately 120-foot width of the middle embayment inlet, we expect the sound levels to exceed 150 dB up to approximately 50 feet outside the middle embayment. We also expect varying levels of behavioral responses from any salmon and steelhead exposed to SPLs above 150 dB within 151 feet of steel piles being installed with an impact hammer. These responses

range from no change, to mild awareness, to a startle response (Hastings and Popper 2005). Some fish will flee the immediate area for the duration of impact pile driving activity. These fish are expected to move short distances or seek cover. Forage from invertebrate drift and benthic macroinvertebrates will be maintained. Therefore, relocations are not expected to effect growth. However, minimal cover exists throughout the action area. Therefore, we do expect a small number of juveniles from both species will experience increased risk of predation from larger fish and birds from avoiding elevated SPLs for up to 4 days in year 1, and up to 3 days in year 2 or 3. Risk increases as the duration of pile driving increases, and as the distance moved increases.

We agree with Grette that pile driving is unlikely to result in instantaneous injury to juvenile or adult UCR spring-run Chinook salmon or UCR steelhead, or result in injury or death by the cumulative effects of repeated pile strikes. The anticipated single strike peak dB is below 206 and the anticipated RMS dB is below 187.

A small number of adult UCR steelhead will be migrating through the action area outside the embayments during pile driving, and may delay their migration while piles are being installed in the middle embayment with an impact pile driver. Though impact pile driving may affect migratory behavior, it is not expected to prevent upstream or downstream passage because pile driving in the middle basin will only occur for 4 days in year 1, will not occur continuously throughout the day, and will not occur at night when adults can continue their upstream migration. Therefore, we expect a small number of adult UCR steelhead will experience migration delays intermittently for up to 12 hours (daylight work period) on four pile driving days in year 1, with migration resuming overnight.

Turbidity

Removal of the docks in the upper and middle basins, and installation of the docks in the middle basin, will occur in year 1 and take approximately 3 months to complete. Removal and replacement of the docks in the lower basins will occur in year 2 or 3 and will take approximately 3 weeks to complete.

In-water activities will reduce water quality intermittently within the action area during the in-water work window (July 16–February 28) in year 1 and in year 2 and/or 3. The proposed action is expected to temporarily increase delivery of sediment to the waterway and suspend fine sediment during: pile removal, pile driving, barge and boat movements, removal of the existing docks and floats, and installation of the new docks and float structures, thereby increasing turbidity in the water column. Low to moderate levels of turbidity can provide cover from predation (Gregory and Levings 1998). However, increased fine sediment can be detrimental to juvenile salmon and steelhead in several ways including avoidance of the area, abandonment of cover, stress, and reduced growth rates (Newcombe and Jensen 1996). Turbidity from increased fine sediment may disrupt steelhead feeding and territorial behavior, and may displace fish from preferred feeding and resting areas. It can also delay adult migration to spawning habitat. Direct mortality can occur at very high concentrations or extended exposure to suspended solids. The severity of effect of suspended sediment increases as a function of the sediment concentration and exposure time (Bash et al. 2001; Newcombe and Jensen 1996).

Erosion control measures and best management practices (BMPs) will be implemented and monitored during construction. Therefore, we expect very little sediment will be released from the project site. However, we expect intermittent and localized resuspension of sediment during pile removal, pile driving, barge and boat movements, removal of existing docks and floats, and installation of the new docks and float structures to result in pulses of increased turbidity and suspended sediment concentration. We expect turbidity plumes and fine sediments to disperse and settle within 300 feet downstream, and be indistinguishable from background levels. Most will be contained in each embayment, but we expect boat movements between embayments to result in turbidity plumes up to 300 feet downstream in the main Columbia River channel. Because the substrate in and around the work areas consists primarily of silt and sand with some gravel, we expect the pulses of elevated suspended sediment to be small and last several minutes to an hour. We also expect adults and juveniles migrating, holding, or rearing nearby will be disturbed by the increased turbidity and flee the area, which will increase the risk of predation to a small number of juveniles (Berg and Northcote 1985). Because of the small size and duration of turbidity plumes, we do not expect avoidance of the turbidity plumes to delay migration of adults or affect spawning success. Therefore, we expect intermittent pulses of turbidity for 3 months during year 1, and for 3 weeks during year 2 or 3, will cause short term (a few minutes to an hour) behavioral changes, including fleeing and avoidance of turbidity plumes, to a small number of adult and juvenile UCR steelhead and a small number of juvenile UCR spring-run Chinook salmon, within 300 feet downstream. We also expect turbidity plumes to cause intermittent behavioral changes of adult UCR spring-run Chinook salmon for approximately 2 weeks (last 2 weeks of July) in year 1 and in year 2 or 3. We expect adults and some juveniles will flee the areas of higher turbidity, which will increase the risk of predation to juveniles, but not affect migration or spawning success of adults.

Shading, Safe Passage, and Predation

Docks, floats, and stationary barges moored in shallow water can block light and provide a haven for predatory fish such as smallmouth bass and northern pikeminnow, which prey on juvenile salmonids in the Columbia River system (Fritts and Pearsons 2004; Tabor et al. 2004; Vigg et al. 1991; Zimmerman and Ward 1999). Construction of overwater structures (e.g., docks and pilings) also creates habitat for predatory, perching birds such as cormorants and gulls. In general, predation on juvenile salmonids increases as light intensity decreases (Petersen and Gadomski 1994; Tabor et al. 1998). Similarly, the presence of in-water pilings also creates low velocity areas preferred by predatory fish. Predatory fish such as smallmouth bass and northern pikeminnow select and use in-water and overwater structures (Pribyl et al. 2004; Celedonia et al. 2008). Juvenile salmonids account for high portions of northern pikeminnow diets (Poe et al. 1991; Zimmerman and Ward 1999; Harnish et. al 2014) and avian predator diets (Collis et al. 2002).

Due to the timing of in-water work, the shallow nature of the work area, and the lack of natural cover, we expect only a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead in the action area during project construction. We expect predatory fish species and predatory birds in the action area and utilizing the existing docks and float systems to disperse during removal. Approximately 366 square feet of temporary overwater structure (barge and boat) will be present July 16–February 28 for 2 years (approximately 7.5 months per year) and

create perching habitat for predatory birds and shaded areas that may attract predators such as smallmouth bass and northern pikeminnow (Petersen et al. 1993). Further, reduced light caused by temporary, overhead structure may inhibit or alter migration pathways of juvenile salmonids, including delays due to disorientation, dispersal of schools, and a change in migratory routes into deeper waters. The barge and boat will be located in areas used by juvenile UCR spring-run Chinook salmon and UCR steelhead, for feeding, resting, and growth during rearing and downstream migration (Mains and Smith 1964; Dauble et al. 1989; Beeman and Maule 2006; Chapman 2007; Timko et al. 2011). Therefore, we expect temporary overwater structures (366 square feet) will cause behavior modifications of a small number of individual juvenile UCR spring-run Chinook salmon and UCR steelhead, including altered migration and avoidance, that will increase risk of predation by predatory birds and fish for up to 7.5 months per year for 2 years.

Further, because the new 10,414 square feet of floats and decks will be grated and all 37 steel piles (15.2 square feet total) will be covered with white epoxy and anti-perching caps, we expect the new float structure will provide only a minimal amount of shading and predatory habitat. Therefore, we expect only a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead will be permanently impacted each year by altered migration and predation caused from presence of the docks and float structures. Once the project is complete, we expect the 55-square-foot decrease of overwater structure and the predation minimization measures incorporated into the design of the project, such as grated decking, white coloration, and pile caps will reduce predation when compared with the existing structures.

Effects to Critical Habitat

Water Quality

Water quality will be reduced intermittently within the project area for 3 months in year 1 and for 3 weeks in year 2 or 3. The proposed action is expected to temporarily increase delivery of sediment to the waterway and suspend fine sediment during: pile removal, pile driving, barge and boat movements; removal of the existing docks and floats; and installation of the new docks and float structures; thereby increasing turbidity in the water column.

Because erosion control measures and BMPs will be installed and maintained during construction, very little sediment is expected to be released from the project site. Localized resuspension of sediment during in-water activities will result in small pulses of increased turbidity and suspended sediment concentration up to 300 feet downstream of the in-water work area. We expect the pulses of elevated suspended sediment to last several minutes to an hour. NMFS also expects minor leaks and spills of petroleum-based fluids (not more than ounces) from the use of heavy equipment, that will be contained on site in secondary containment basins. Therefore, NMFS expects small, temporary, and intermittent, negative effects to the water quality PBF from increased turbidity and suspended sediment concentration and minor leaks and spills from heavy equipment for 3 months in year 1 and for 3 weeks in year 2 or 3.

Forage

The proposed action will negatively affect the short-term availability of benthic invertebrates by covering or temporarily displacing them by resuspension and settling of suspended sediment up to 300 feet downstream of turbidity generating activities. Terrestrial macroinvertebrate inputs and invertebrate drift will continue to contribute to salmonid forage, and will also recolonize disturbed substrate once project construction is complete. We expect recolonization to occur within a few days to a few months after project completion (Fowler 2004; Griffith and Andrews 1981; Yount and Nemi 1990). Given the small area of temporary impacts, and the supply of forage from terrestrial inputs and invertebrate drift, NMFS expects this project to have a small, 2-year negative effect on the forage PBF from resuspension and settling of suspended sediments.

Long-term, there will be a permanent loss of 15.2 square feet of streambed from installation of 37 8-inch-diameter steel piles associated with the new decks and float structures, approximately the same amount (15.33 square feet) lost from existing piles. Therefore, we expect the project to continue to have a small, permanent effect on the forage PBF from habitat loss.

Substrate

Minor levels of sediment deposition will occur intermittently in the action area for 3 months in year 1 and 3 weeks in year 2 or 3 as small turbidity plumes settle out within 300 feet downstream. We expect deposited sediment to be indistinguishable from background levels. In addition, installation of the new decks and float structures will permanently displace up to 15.2 square feet of substrate in the embayments, slightly less than the existing 15.33 square feet. Therefore, NMFS expects a very small (up to 300 feet downstream of turbidity generating activities), intermittent, and temporary (a few minutes to an hour each during 3 months in year 1 and 3 weeks in year 2 or 3), negative effect to the substrate PBF from resuspension and settling of suspended sediment. We also expect a very small, permanent negative effect to substrate to continue at the scale of the action area from habitat loss.

Unobstructed Passage

As described in the Effects to Species section above, we expect the project to hinder migration, rearing, and feeding of salmon and steelhead due to elevated underwater noise from pile driving, structure and shading created by the barge and boat, and installation of the permanent docks and float structures. Therefore, NMFS expects small, temporary negative effects to the safe passage PBF during project construction. Once the project is complete, we expect the 55-square-foot decrease of overwater structure and the predation minimization measures incorporated into the design of the project, such as grated decking, white coloration, and pile caps will reduce predation and improve passage survival when compared with the existing structures.

Cumulative Effects

"Cumulative effects" are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the

proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. NMFS is not aware of any future non-Federal activities within the action area that could adversely affect UCR spring-run Chinook salmon and UCR steelhead, or their critical habitat. Therefore, NMFS assumes that future State and private actions and land uses will continue within the action area at roughly their current rate.

Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects, taking into account the status of the species and critical habitat, to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

Species

Adults and juveniles from the Methow population of UCR spring-run Chinook salmon, and from the Okanogan and Methow populations of UCR steelhead, use the action area as a migration corridor. Juveniles of these populations also rear in the action area, and adult steelhead may over-winter in the action area. NMFS recently reaffirmed that UCR spring-run Chinook salmon and UCR steelhead have not achieved viable status and are at a continuing risk of extinction. Major threats include, but are not limited to: climate change, regulation of the Columbia River, and impairment of tributary habitat. Upper Columbia River spring-run Chinook salmon are listed as endangered, and UCR steelhead are listed as threatened under the ESA. All populations of UCR spring-run Chinook salmon and UCR steelhead remain at high risk.

Based on the species life stages and the activities described in the submitted BA and supplemental information, the proposed action is expected to result in harm, harassment, injury or death of a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead; harassment of a small number of adult UCR spring-run Chinook salmon and UCR steelhead within the action area from increased turbidity; increased predation (juveniles only); and migration obstruction from over-water structure (barge and boat), pile driving, and in-water steel piles. These adverse effects would be to the Methow population of UCR spring-run Chinook salmon, and the Methow and Okanogan populations of UCR steelhead.

Intermittent pulses of turbidity generated during pile removal, pile driving, barge and boat movements, removal of the existing docks and floats, and installation of the new docks and float structures, will cause short term (a few minutes to an hour) behavioral changes, including fleeing and avoidance of turbidity plumes, to a small number of adult and juvenile UCR steelhead and a small number of juvenile UCR spring-run Chinook salmon, within 300 feet downstream, for approximately 3 months in year 1 and 3 weeks in year 2 or 3; and to adult UCR spring-run Chinook salmon for approximately 2 weeks in year 1 and year 2 or 3. We expect adults and some juveniles will flee the areas of higher turbidity, which will increase the risk of predation to

juveniles. We do not expect avoiding turbidity plumes to delay adult migration or spawning success.

We also expect temporary overwater structure (366 square feet of barge and boat) will cause behavior modifications of a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead, including altered migration and avoidance, that may intermittently increase the risk of predation by predatory birds and fish for approximately 3 months in year 1 and 3 weeks in year 2 or 3.

Neither vibratory nor impact pile driving is expected to result in instantaneous injury or death of salmon or steelhead. NMFS expects sound generated during vibratory pile driving will cause behavioral changes to a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead within 72 feet of steel piles installed with a vibratory hammer. If impact pile driving occurs, we expect a small number of juvenile UCR spring-run Chinook salmon and adult and juvenile UCR steelhead will alter their behavior and flee the immediate area for the duration of impact pile driving activity. Behavioral modifications of adult and juvenile salmon and steelhead are expected to occur within 151 feet of 8-inch-diameter steel piles being installed with an impact hammer for 4 days in year 1, and up to 3 days in year 2 or 3. Behavioral modifications and fleeing are not expected to affect growth of juveniles, but we do expect a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead will experience increased risk of predation from larger fish and birds from avoiding elevated SPLs for up to 4 days in year 1 and up to 3 days in year 2 or 3. NMFS expects a small number of adult UCR steelhead will move away from the sound generated during impact pile driving, and a small number will delay their migration for up to 12 hours per day for 4 days in year 1. Though pile driving will affect adult migratory behavior, it is not expected to prevent upstream or downstream passage because pile driving will only occur intermittently in the middle embayment for 4 days in year 1, and pile driving will not occur at night when adults can continue their upstream migration.

We expect permanent steel piles to annually alter, but not prevent, migration of a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead, and increase their risk of predation during migration, rearing, and feeding. However, we expect the 55-square-foot decrease of overwater structure and the predation minimization measures incorporated into the design of the project, such as grated decking, white coloration, and pile caps will reduce predation when compared with the existing structures.

NMFS has determined that the loss of a small number of juvenile salmon from the Methow population of the UCR spring-run Chinook salmon ESU and the Methow and Okanogan populations of the UCR steelhead DPS caused by the proposed action, and annually from presence of the docks and float structures, is not substantial enough to appreciably alter the abundance, productivity, spatial structure, or diversity of any populations of UCR spring-run Chinook salmon or UCR steelhead. It is NMFS' opinion that when the effects of the action and cumulative effects are added to the environmental baseline, and in light of the status of the species, the effects of the action will not cause reductions in reproduction, numbers, or distribution that would reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of UCR spring-run Chinook salmon and UCR steelhead.

Critical Habitat

Critical habitat in the action area is degraded due to the Columbia River System dams and reservoir (Lake Entiat), and boat docks and associated float structures. The Columbia River hydrosystem alters the river environment and affects fish passage. Salmon and steelhead are exposed to high rates of predation from fish and birds. In addition, the cumulative effects of State and private actions within the action area are anticipated to continue to have negative effects on ESA-listed salmonids. Climate change is likely to further impact designated critical habitat by increasing water temperatures and changes to the hydrological regime.

The proposed action will temporarily reduce the function of critical habitat PBFs for water quality (turbidity and chemical contamination), forage, substrate, and free of artificial obstruction/safe passage.

A small, negative effect to the water quality PBF will result from turbidity and leaks and spills of petroleum-based fluids. Small, intermittent, and localized increases in turbidity are expected to last a few minutes to an hour each for approximately 3 months in year 1 and 3 weeks in year 2 or 3, and extend up to 300 feet downstream of turbidity generating activities (pile removal, pile driving, barge and boat movements, removal of the existing docks and floats, and installation of the new docks and float structures). NMFS also expects minor leaks and spills of petroleum-based fluids (not more than ounces) from heavy equipment that will be contained on site.

A small, negative effect to the forage and substrate PBFs will result from resuspension and settling of suspended sediment and installation of steel piles. The proposed action will have a short-term negative effect on benthic macroinvertebrates by covering or displacing them by settling of suspended sediment up to 300 feet downstream of turbidity generating activities, causing a temporary change to prey availability. We expect benthic macroinvertebrates will start to recolonize the action area as soon as the 2- to 3-year project is complete, and benthic communities to be reestablished in a few months. Permanent loss will continue to occur in 15.2 square feet from steel piles. Small, temporary (up to 2 years) negative effects to the substrate PBF will occur at the scale of the action area from minor levels of sediment deposition as small turbidity plumes settle out within 300 feet downstream of in-water activities. Substrate will permanently be lost in 15.2 square feet from steel piles.

A small, negative effect to the free of artificial obstruction/safe passage PBF will occur from pile driving (4 days in year 1, and up to 3 days in year 2 or 3), up to 366 square feet of temporary overwater structures for 7.5 months for 2 years, and the permanent presence of 37 8-inch-diameter steel piles (15.2 square feet), which will result in permanent loss of some migration and rearing habitat in the action area. Once the project is complete, we expect the 55-square-foot decrease of overwater structure and the predation minimization measures incorporated into the design of the project, such as grated decking, white coloration, and pile caps will reduce predation and increase survival when compared with the existing structure. Therefore, we expect an improvement in the safe passage PBF upon completion of the project.

Based on our analysis that considers the current status of PBFs, adverse effects from the proposed action will cause a temporary and localized decline in the quality and function of PBFs

in the action area. Overall, we also expect an improvement in the safe passage PBF. Because of the small scale and extent of the effects to PBFs, we do not expect a reduction in the conservation value of critical habitat in the action area. As we scale up from the action area to the designation area of critical for each species, the proposed action is not expected to appreciably reduce the conservation value of the designated critical habitat.

Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of UCR spring-run Chinook salmon and UCR steelhead, or destroy or adversely modify their designated critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a 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 further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Harass" is further defined by interim guidance as to "create 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." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this Incidental Take Statement (ITS).

Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take of adult and juveniles from the Methow population of UCR spring-run Chinook salmon and the Methow and Okanogan populations of UCR steelhead is reasonably certain to occur as follows: (1) short-term changes in behavior of adults and juveniles, and increased predation of juveniles displaced by turbidity plumes; (2) increased predation of juveniles from changes to migration behavior caused by the presence of over-water structures and pile driving; and (3) altered migration behavior of adult UCR steelhead from pile driving. We expect a small number of juveniles of each population of UCR spring-run Chinook salmon and UCR steelhead to alter their behavior and be injured or killed; a small number of adult UCR spring-run Chinook salmon and UCR steelhead from each population to alter their behavior; and a small number of adult UCR steelhead to alter their migration behavior.

Incidental Take from Turbidity and Increased Predation

NMFS anticipates the proposed action will result in harm to fish by increasing turbidity from pile removal, pile driving, barge and boat movements, removal of the existing docks and floats, and installation of the new docks and float structures. Take in the form of harm caused by the temporary increases in turbidity will be manifested in altered behaviors including avoidance of the area, abandonment of cover, and exposure to predators. We expect turbidity plumes to extend no further than 300 feet and persist for no more than an hour. It is not possible to determine the number of fish killed by the turbidity plumes because of the range of responses that individual fish will have, and because the numbers of fish present at any time is highly variable. Therefore, NMFS uses a surrogate for incidental take caused by the turbidity. The surrogate is the areal extent of the turbidity plume. The surrogate is causally linked to the take pathways because the scale of the effect is related to the size of the turbidity plume. Thus, the extent of take will be exceeded if turbidity plumes extend further than 300 feet below the work area. While this surrogate is coextensive with the proposed action, it functions as an effective reinitiation trigger because turbidity plumes will be monitored and reported daily.

Incidental Take from Predation from Presence of In-water and Overwater Structures

NMFS expects the proposed action will result in harm, harassment, injury and death to juvenile salmon and steelhead by increases in exposure to avian and fish predators. We expect injury or death of juvenile salmon and steelhead from increased predators due to the increase in shade from temporary overwater structures (366 square feet). We expect the presence of permanent steel piles to annually alter, but not prevent, migration of a small number of juvenile UCR spring-run Chinook salmon and UCR steelhead, and, therefore, increase their risk of predation during migration, rearing, and feeding.

It is not possible to determine the number of fish that will be killed by predation because of the presence of temporary overwater structures, or permanent in-water and overwater structures, because of the range of responses that individual fish will have, and because the numbers of fish present at any time is highly variable. Therefore, NMFS uses surrogates for incidental take caused by these structures. The surrogates are causally linked to the take pathways because, for in-water and over-water structures, the risk of predation increases with the amount and size of in-water and overwater structures and the duration the structure is in place. The risk of death increases with the size of the structures because larger structures are expected to harbor more predators. The risk of death increases with duration of the structure presence because the longer the structures are present and harboring predators, the more opportunity there is for interaction of juvenile salmon and steelhead and predators.

Therefore, the best available indicators to measure the extent of incidental take caused by increased predation due to in-water and overwater structures are:

- The amount and duration of temporary overwater structures.
- The amount of permanent overwater structures.
- The amount of permanent in-water structures.

The extent of take will be exceeded if:

- More than 366 square feet of temporary overwater structure (barge and boat) is present for project construction.
- If barges and boats are present for more than 7.5 months per year for 2 years.
- If more than 10,414 square feet of permanent overwater structure is constructed.
- If more than 15.2 square feet of permanent in-water structure is constructed.

These surrogates are effective reinitiation triggers because they represent an observable metric of the extent of take, which if exceeded, would trigger consultation.

Incidental Take from Hydroacoustic Sound Pressure Levels during Pile-Driving

NMFS expects harm, harassment, injury, or death to juvenile UCR spring-run Chinook salmon and UCR steelhead, and harm and harassment of adult UCR steelhead by exposure to hydroacoustic SPLs during vibratory and impact pile-driving activities. It is not possible to determine the number of fish that will be harmed or harassed by vibratory and impact pile driving because of the range of responses that individual fish will have, and because the numbers of fish present at any time is highly variable. Therefore, NMFS uses a surrogate for incidental take. The surrogate is causally linked to the take pathways because the risk of injury and severity of injury from sound pressure waves increase with additional pile strikes, and more fish are exposed to possible injury when the time period of pile driving is longer.

The best available indicators to measure the extent of incidental take caused by pile driving are:

- The number of piles installed.
- The number of pile strikes from an impact driver over the course of a single day.
- The duration of pile driving.

The extent of take will be exceeded if:

- More than 37 8-inch-diameter steel piles are installed.
- More than 1,146 pile strikes from an impact pile driver occur in a single day.
- Pile driving occurs for more than 4 days in year 1, and more than 3 days in year 2 or 3.

These surrogates are effective reinitiation triggers because they represent an observable metric of the extent of take, which if exceeded, would trigger consultation.

If at any time the level or method of take exempted from take prohibitions and quantified in this opinion is exceeded, reinitiation of consultation may be required.

Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to UCR spring-run Chinook salmon and UCR steelhead, or destruction or adverse modification of their critical habitat.

Reasonable and Prudent Measures

"Reasonable and prudent measures" (RPMs) are measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

The Corps shall:

1. Minimize the amount of time the barge and boat are present in the action area.
2. Track, monitor, and report on the proposed action to ensure that the project is implemented as proposed, and the amount and extent of take is not exceeded.

NMFS believes that full application of conservation measures included as part of the proposed action, together with the use of the RPM and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of listed species due to completion of the proposed action.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following term and condition implement RPM 1:
    a. Each year, remove the barge and boat from the action area as soon as they are no longer needed, and once in-water construction is complete.

2. The following terms and conditions implement RPM 2:
    a. Track and monitor construction activities to ensure that the conservation measures are meeting the objective of minimizing take.
    b. Conduct turbidity monitoring as follows:
        i. Monitoring will be conducted daily, every 4 hours during daylight hours, while in-water work is conducted.
        ii. Observations shall occur daily before, during, and after commencement of in-water work and compared to observable sediment load upstream of the action area.
        iii. Measure or observe background turbidity levels at an undisturbed site approximately 100 feet upstream of the project area.
        iv. Measure or observe turbidity levels approximately 300 feet downstream from the project area, or within any visible turbidity plume.

c. Submit a completion of project report to NMFS two months after project completion. The completion report shall include, at a minimum, the following:

   i. Starting and ending dates for work completed, with in-water work period specified.
   ii. Summary and details of turbidity monitoring.
   iii. Any daily observed sediment plume from the in-channel work area to 300 feet downstream during the in-water construction period.
   iv. A summary of pollution and erosion control inspection results, including results of implementing required BMPs, and including a description of any erosion control failure, contaminant release, and efforts to correct such incidences.
   v. Number and species of fish observed injured or killed.
   vi. Date, number of piles installed by size, method of installation, type and size of hammer, water depth, substrate, and number of pile strikes per 12-hour day.
   vii. Size of wood block used to attenuate sound.
   viii. Duration barge and boat are in the action area each year.
   ix. Reference to NMFS consultation number WCRO-2023-02888.

d. All reports will be sent to: crbo.consultationrequest.wcr@noaa.gov.

e. If the amount or extent of take is exceeded, stop project activities and notify NMFS immediately.

Reinitiation of Consultation

Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

Essential Fish Habitat

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson–Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was conducted pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects may result from actions occurring within EFH or outside of it and may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH (50 CFR 600.0-5(b)).

NMFS determined the proposed action would adversely affect EFH of Pacific salmon as follows:

1. Short-term decrease in water quality, and rearing and migration habitat, due to the elevation of turbidity up to 300 feet downstream from pile removal, pile driving, barge and boat movements, removal of the existing docks and floats, and installation of the new docks and float structures.
2. Temporary and intermittent negative effects on forage by covering or displacing benthic macroinvertebrates by settling of suspended sediment and turbidity plumes up to 300 feet downstream of sediment disturbing activities. Sediment disturbing activities are expected to occur intermittently for approximately 3 months in year 1 and 3 weeks in year 2 or 3.
3. Permanent loss of 15.2 square feet of forage, and rearing and migration habitat, from the installation of 37 8-inch-diameter steel piles.

NMFS determined that measures included in the BA and supplemental information are sufficient to avoid, minimize, mitigate, or otherwise offset the impact of the proposed action on EFH.

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600. 920(l)).

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The biological opinion will be available through NOAA Institutional Repository https://repository.library.noaa.gov/welcome. A complete record of this consultation is on file at NMFS' Columbia Basin Branch.

Please direct questions regarding this letter to Colleen Fagan, Columbia Basin Branch, at (541) 962-8512 or colleen.fagan@noaa.gov.

Sincerely,

Nancy L. Munn, Ph.D.
Acting Assistant Regional Administrator
Interior Columbia Basin Office

cc: Jenae Churchill, U.S. Army Corps of Engineers, jenae.churchill@usace.army.mil
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