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**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
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Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens  
Fishery Conservation and Management Act Essential Fish Habitat Response for the  
Yankee Fork Adaptive Management Channel Sealing Project (One Project)

Dear Mr. Hamel, Lieutenant Colonel Childers, Mr. Mark, and Mr. McLaughlin:

This letter responds to your February 11, 2022, request for initiation of consultation with the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA) for the subject action. Your 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 actions and its potential effects to listed species and designated critical habitat.

The Bonneville Power Administration (BPA), as the lead action agency, determined the proposed action may affect, and is likely to adversely affect (LAA) Snake River (SR) spring/summer Chinook salmon (*Oncorhynchus tshawytscha*) and SR Basin steelhead (*O. mykiss*). The BPA also determined the proposed action may affect, but is not likely to adversely affect (NLAA) designated critical habitat for SR Chinook salmon and SR Basin steelhead. This biological opinion (opinion) addresses each of these determinations.

We reviewed the BPA's consultation request and related initiation package. Where relevant, we have adopted the information and analyses you 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 BPA's February 11, 2022, final



biological assessment (BA) (BPA 2022): proposed action (pages 5-14); Section C (Listed Species and Critical Habitat Review, pages 14-15); Section D (Environmental Baseline, pages 15-20); Direct and Indirect Effects (pages 15-26), and all figures, tables, and appendices. The referenced BA we have adopted is available in its entirety in our official project record, available at NMFS' Boise Office or by contacting Chad Fealko (chad.fealko@noaa.gov).

The Bonanza City Floodplain Restoration Project (Bonanza Project) was implemented between 2018 and 2020 by the BPA, U.S. Army Corps of Engineers (COE), Shoshone Bannock Tribes, Salmon Challis National Forest (SCNF), U.S. Bureau of Reclamation (BOR), and Trout Unlimited. The Bonanza Project is located on the mainstem Yankee Fork Salmon River (YFSR), approximately 8.9 miles upstream from the Salmon River confluence. That action removed placer tailings and reconstructed a new channel and floodplain – addressing factors that have limited natural processes and degraded fish habitat for about 70 years (USBR 2012). After the new channel was activated in late-summer of 2020 (a drought year), surface water connectivity was lost in portions of the porous new channel, creating a temporary fish passage barrier on the YFSR. Although connectivity was reestablished from spring runoff through summer, drought conditions continued through 2021, and the project reach again experienced dewatered channel segments during late-summer and into the fall/winter. NMFS staff (C. Fealko) were engaged in the original Bonanza Project and during the 2020 and 2021 action agency response to move fish past the barrier, sealing of the bypass channel area in 2020, and establishing monitoring, evaluation, and reporting objectives.

Following 2021, NMFS worked with all involved parties to discuss monitoring data and potential treatment options to provide long-term fish passage. Ultimately, the parties developed and agreed on the channel sealing action described in the BPA's final BA (BPA 2022). NMFS received a draft proposed action on December 27, 2021, and NMFS provided responses by email on January 4, 2022. A draft BA was subsequently received on January 12, 2022. NMFS reviewed and shared comments on the draft BA on January 25, 2022. The BPA submitted a consultation initiation package to NMFS on February 11, 2022. NMFS reviewed the initiation package and agreed that consultation was formally initiated on February 11, 2022. On April 12, 2022, NMFS provided a copy of the proposed action and terms and conditions sections of the draft opinion to the action agencies and the Shoshone-Bannock Tribes. NMFS did not receive any comments.

### **Proposed Action**

As disclosed in the final BA, the action being considered is the BPA's proposed acceleration of the natural channel sealing process in the upper and middle reaches of the Bonanza Project by placing up to 320 cubic yards (CY) of crushed local origin substrate in the new YFSR channel during 2022 and 2023 (640 CY total). Placed material will be well graded (less than 0.75 inches diameter) and is intended to replenish the interstitial material lost during historical mine dredging. Hauling and staging of approximately 160 CY of the placed material to three locations in the Bonanza Reach will occur between May 1 and June 30. Later, on the descending limb of the hydrograph, the material will be pushed or scooped into the channel at the three locations, allowing water to redistribute the material through transport reaches and deposit it in the targeted areas (see BA Figure 11 for example). Gravel will be metered into the stream slowly to meet turbidity limits (discussed below) resulting in placement of 20 to 40 yards of material a day

(between three sites) for a total of 4 to 8 days each spring. A more targeted addition of up to 160 CY of additional material across five habitat units will occur during the summer of 2022, between July 8 and August 14, which is the period recommended for in-water work (USBWP 2005). This material will be added using a track-hoe, dribbling the material out of the bucket to sprinkle it over the targeted areas (see BA Figure 6). There will be times during project implementation when heavy equipment will operate in a wetted channel, including crossing a side channel in the spring and potentially operating the track-hoe from within the mainstem YFSR during the summer applications. Specific best management practices designed to avoid and minimize adverse effects are discussed in detail on pages 9 through 13 of the BA and are incorporated by reference.

If determined necessary after review of the 2022 gravel placements<sup>1</sup>, partners may add up to 320 CY of additional material in 2023. Placement of material during 2023 will occur during the same time periods and using the same methods as outlined above for 2022. Total additions of placed material to the YFSR would not exceed 640 CY for the combined two-year period.

The BPA, as the principle funding entity, is the lead Federal action agency for this consultation. The COE is anticipated to authorize the proposed fill under section 404 of the Clean Water Act (CWA). The BOR is anticipated to continue providing engineering and monitoring support of the proposed action. The SCNF manages some of the land where effects will occur and remains an engaged project partner. The COE, SCNF, and BOR are considered secondary Federal action agencies.

### **Status of Species and Critical Habitat**

We examined the status of each species that 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. The BA included background information on the species (pages 14-17) and provided information, regarding which species and life stages utilize the action area (section 4.0, pages 18-21). We have supplemented this information with abundance, productivity, spatial structure, diversity, and limiting factors to recovery information for these species in Table 1.

The BPA determined the action is NLAA designated critical habitat for SR spring/summer Chinook salmon and SR Basin steelhead. Following our review of the information presented in the BA, we concluded temporary water turbidity exposure and sedimentation of spawning gravel caused by the action are not insignificant or discountable and thus we concluded the action is LAA critical habitat for both species. For this reason, we examined the condition of critical habitat throughout the designated area and discuss the function of the physical or biological features (PBFs) essential to the conservation of the species that create the conservation value of that habitat. This opinion adopts the BA's environmental baseline discussion (Section D and Appendix A of BPA 2022). We have supplemented this information with critical habitat information for SR spring/summer Chinook salmon and SR Basin steelhead at the scale of the

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<sup>1</sup> Water loss studies will be conducted after the spring addition of material, during the early summer of 2022. The summer additions of material will target specific locations of water seepage, based on the results of the studies. Water loss studies will continue during the fall of 2022 and, if material additions are seen to have reduced water loss compared to previous studies in 2020 and 2021 but loss still exceeds typical base flow, material additions will be repeated during 2023 using the same methods as outlined for 2022. However, placement locations, timing, and relative amounts of material added may differ based on observations and water seepage loss measurements made during 2022.

ESA listings in Table 2. Table 2 is based on the detailed information on the status of critical habitat throughout the designation area provided in the recovery plan for each species (NMFS 2017) and the most recent status review (NMFS 2016), which are incorporated by reference here.

Table 1. Most recent listing classification and date, status summary (including recovery plan reference and most recent status review and biological viability update), and limiting factors for species considered in this opinion.

| Species   | Listing Status        | Status Summary   | Limiting Factors   |
|---|-----------------------|--|--|
| <b>Snake River Spring/summer Chinook Salmon</b> | Threatened<br>6/28/05 | This evolutionarily significant unit (ESU) comprises 28 extant and four extirpated populations, organized into five major population groups (MPGs), none of which are meeting the viability goals laid out in the recovery plan (NMFS 2017). In 2016, NMFS concluded the species should remain listed as threatened based on its review of available viability and listing factor information. Since then, the Northwest Fisheries Science Center (NWFSC) has reviewed updated viability criteria information (Ford 2022) and concluded all but three populations (Minam River, Bear Valley, and Marsh Creek) in the ESU are at high risk for abundance and productivity (Ford 2022). Most populations will need to see increases in abundance and productivity in order for the ESU to recover. Spatial structure/diversity risk across the ESU is low or moderate for all populations except the Grande Ronde River Upper Mainstem, which is at high risk (Ford 2022). For the most recent five-year period, the majority of populations experienced sharp declines in abundance, primarily due to variation in ocean survival (Ford 2022). Overall, the ESU continues to be at moderate-to-high risk. | <ul style="list-style-type: none"> <li>• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor.</li> <li>• Degraded freshwater habitat, including altered stream flows and degraded water quality.</li> <li>• Climate change is reducing freshwater and ocean survival and projected to worsen.</li> <li>• Harvest-related effects.</li> <li>• Predation in the migration corridor.</li> <li>• Potential effects from high proportion of hatchery fish on natural spawning grounds.</li> </ul> |
| <b>Snake River Basin Steelhead</b>              | Threatened<br>1/5/06  | This distinct population segment (DPS) comprises 24 populations organized into five MPGs. In 2016, NMFS concluded the species should remain listed as threatened based on its review of available viability and listing factor information. Since then, the NWFSC has reviewed updated viability criteria information (Ford 2022). Currently, one population is highly viable, five populations are rated as viable, 14 populations are at moderate risk of extinction, and four are rated at high risk of extinction (Ford 2022). None of the five MPGs are meeting recovery plan (NMFS 2017) objectives and just two MPGs (Clearwater River and Grande Ronde River) are rated as "maintained." More populations will need to become viable through increases in abundance and productivity to improve the DPSs potential to recover. Additionally, there   | <ul style="list-style-type: none"> <li>• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor.</li> <li>• Potential effects from high proportion of hatchery fish on natural spawning grounds, including out-of-population influence.</li> <li>• Degraded fresh water habitat and loss of ecological functions.</li> </ul>  |

| Species | Listing Status | Status Summary  | Limiting Factors   |
|---------|----------------|---|--|
|         |                | is great uncertainty regarding how many hatchery fish are spawning naturally, particularly near major hatchery release sites. Compared to the prior five-year period (2010-2014), adult abundance estimates declined sharply between 2015 and 2019, with declines averaging about 50 percent across the DPS (range 15% for Lochsa and Selway Rivers to 78% for Pahsimeroi) (Ford 2022). | <ul style="list-style-type: none"> <li>• Harvest-related effects, particularly B-run steelhead.</li> <li>• Predation in the migration corridor.</li> </ul> |

The proposed action will occur in the YFSR subbasin, a tributary to the Salmon River. Steelhead here are part of the Upper Salmon River population within the Salmon River major population group (MPG), which contains a total of 12 populations. The Upper Salmon River population is not currently identified in NMFS' example recovery scenario for the MPG, but it does need to achieve a maintained status. The population is located farther upstream than some other populations and could be used to satisfy viability criteria in lieu of other populations in the MPG. The Upper Salmon River population is intermediate in sized and has a minimum abundance threshold of 1,000 adults with a minimum productivity threshold of 1.14. Population specific VSP data remains unavailable for the entire population area. Ford (2022) produced recent abundance and productivity estimates for a "supergroup" of populations based on genetic stock identification markers for randomly sampled adult returns at Lower Granite Dam and for a portion of the Upper Salmon population based on passive integrated transponder tag detection (PIT tag) data. In both instances, natural-origin steelhead abundance between 2015 and 2019 declined sharply compared to the 2011-2014 levels. Specifically, at the supergroup scale (i.e., all Salmon River populations upstream of and including Panther Creek) natural-origin adult abundance declined 64 percent (from 5,814 to 2,112 adults) and the PIT tag estimate for the Upper Salmon River population having data declined a comparable 68 percent (from 327 to 105 adults). Although NMFS has not yet completed the 2021 status review, viability analysis and preliminary evaluations of listing factors suggest the Snake River Basin steelhead DPS will remain threatened.

The YFSR subbasin is an independent SR spring/summer Chinook salmon population. The YFSR population is one of nine populations in the Salmon River MPG and is a basic-sized population with a minimum abundance level of 500 adults with a minimum threshold productivity of 2.21. The YFSR is not one of the six independent populations needed to be viable or highly viable in order for the MPG to be viable, but the population does need to improve to a maintained status (NMFS 2017). Ford (2022) found the YFSR population to be at high risk of extinction due to low abundance/productivity and high-risk diversity ratings. The best scientific and commercial data available with respect to the adult abundance of YFSR Chinook salmon indicate a substantial downward trend in abundance and productivity when comparing returns from 2010–2014 to 2015–2019. Specifically, 5-year geometric mean adult abundance (2015-2019) declined 87 percent for this population (from 169 to 22 natural origin adults) when compared to the prior five-year period (2010-2014). Although NMFS has not yet completed our most recent status determination, declining abundance and productivity will likely preclude any deviation from the high-risk rating assigned in 2015.

Table 2. Critical habitat, designation date, Federal Register citation, and status summary for critical habitat considered in this opinion.

| Species                                  | Designation Date and Federal Register Citation | Critical Habitat Status Summary  |
|--|--|--|
| Snake River Spring/summer Chinook salmon | 10/25/99; 64 FR 57399                          | Critical habitat consists of river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon Rivers (except the Clearwater River) presently or historically accessible to this evolutionarily significant unit (ESU) (except reaches above impassable natural falls, and Dworshak and Hells Canyon Dams). Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems. |
| Snake River Basin steelhead              | 9/02/05 70 FR 52630                            | Critical habitat encompasses 25 subbasins in Oregon, Washington, and Idaho. Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems.  |

NMFS describes critical habitat in terms of essential PBFs of that habitat to support one or more life stages (e.g., sites with conditions that support spawning, rearing, migration, and foraging). For SR spring/summer Chinook and SR Basins Steelhead, PBFs include spawning gravel, water quality, water quantity, food (juvenile migration only), access, riparian vegetation, water temperature, substrate, water velocity, cover/shelter, space, and safe passage. Across the designations, the current ability of PBFs to support the species varies from excellent in wilderness areas to poor in areas of intensive human land use. Climate change and its influence on PBFs such as water quality, water quantity, temperature, and safe passage are expected to exacerbate current conditions for salmon, limiting future run timing (due to reduced adaptability) and thus increasing the difficulty of species recovery. A synthesis of current literature pertinent to these species’ future habitat conditions can be found in NMFS’ recovery plans (NMFS 2015, 2017) and recent climate vulnerability assessments (Crozier et al. 2019).

For both species, the construction and operation of water storage and hydropower projects in the Columbia River basin, including the run-of-river dams on the mainstem lower Snake and lower Columbia Rivers, have altered biological and physical attributes of the mainstem migration corridor for juveniles and adults. However, several actions taken since 1995 have reduced the negative effects of the hydro system on juvenile and adult migrants. Examples include providing spill at each of the mainstem dams for smolts, steelhead kelts, and adults that fall back over the projects; and maintaining and improving adult fish way facilities to improve migration passage for adult salmon and steelhead (NMFS 2020).

“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). Section B (page 14) of the final BA describes the action area, which we have adopted here to include the Bonanza Project area, where the action will take place (Figure 1) and the YFSR downstream to the mouth of the YFSR at the Salmon River (8.9 miles) to account for potential visible turbidity influences.

## **Environmental Baseline**

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). Section D and Appendix A of the final BA (BPA 2022) describes the environmental baseline that is being adopted here.

Recent restoration work has substantially modified the channel and floodplain function in the YFSR. Within the Bonanza Project area, mine tailing piles previously confined the channel and prevented natural habitat forming processes from occurring. These piles have largely been removed. A new channel template was constructed to enhance the quality and quantity of fish habitat while promoting the ecological processes necessary to maintain and further develop the habitat in the future. Unfortunately, substrate left by the historic dredging lacks small gravel and fine material. Sediment conditions are actually functioning at unacceptable risk due to a lack of fine-grained material being available for spawning. The absence of fines, and a large vertical gradient to groundwater, combined to leave segments of the treated reach dry when YFSR flows drop below approximately 28 cubic feet per second (CFS). Discharge drops below this level during drought years, which occurred in 2020 and 2021. Although the new channel is expected to naturally seal over time, similar to the post-dredging channel, which also was dry after dredging but resealed over time, timeframes are unknown. Prolonged fish passage blockages are incompatible with the anadromous fish recovery needs in the YFSR. Safe passage through this reach is necessary for fall spawning SR spring/summer Chinook salmon to access upstream spawning habitats and for downstream migrating juvenile SR spring/summer Chinook and SR Basin steelhead to access overwintering habitat in the YFSR and Salmon River.

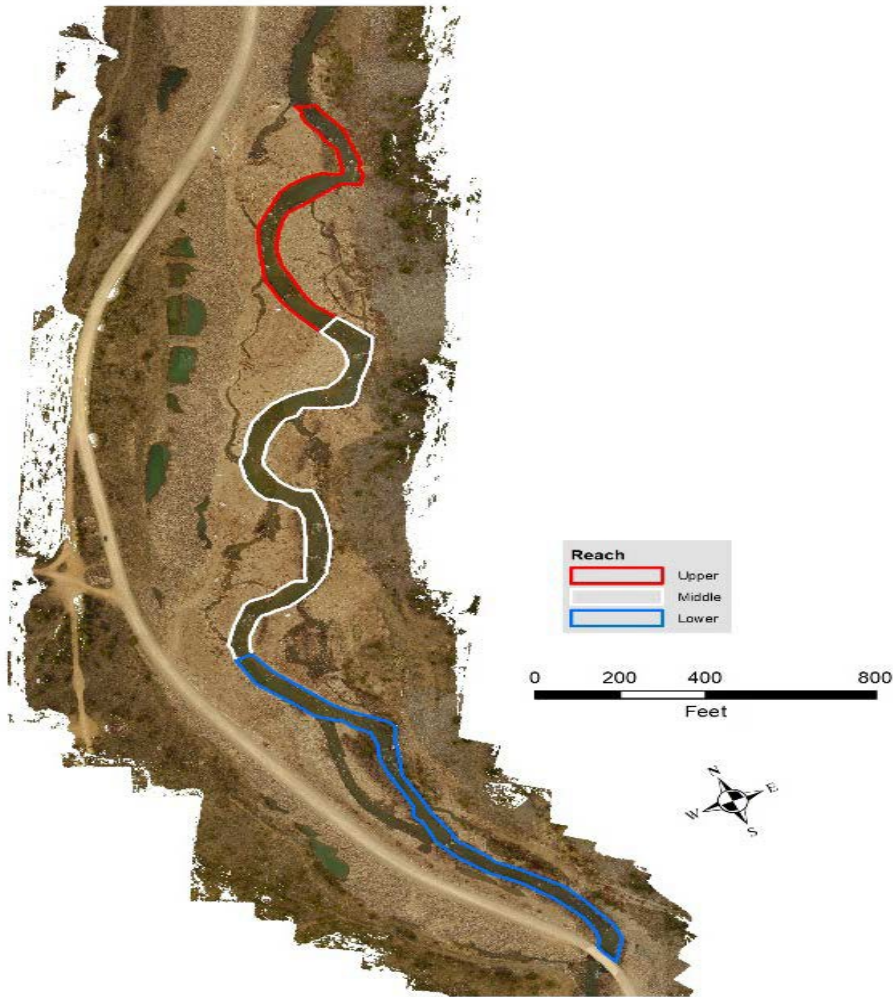


Figure 1. Bonanza Project area, displaying three reaches where substrate will be added to seal the YFSR channel. The action area includes the entire area displayed, as well as the YFSR downstream to its Salmon River confluence (8.9 miles), the maximum extent of anticipated sediment-related effects.

## 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).

The BA provided a detailed discussion and comprehensive assessment of the effects of the proposed action (see pages 20 through 27), and is adopted here [50 CFR 402.14(h)(3)]. NMFS has evaluated this section and after our independent, science-based evaluation determined it



meets our regulatory and scientific standards. The temporary and long-term effects of this proposed action on species are:

- Minor fish disturbance, including displacement from preferred habitats, caused by equipment operating adjacent to and in the YFSR.
- Potential crushing of juvenile spring/summer Chinook salmon and juvenile steelhead by equipment or burying of juvenile fish during gravel placement in live channel.
- Potential sediment deposition on incubating steelhead eggs downstream of spring gravel placements.
- Temporary exposure to elevated turbidity pulses with a small increase in potential predation, behavioral modifications, and minor physiological effects on exposed fish.
- Improved access to spawning habitat (Chinook salmon) and increased growth and survival of juveniles (Chinook salmon and steelhead) due to improved access to rearing and overwintering habitat.

Effects to critical habitat will include:

- Temporary increases in turbidity.
- Minor levels of increased sediment deposition in spawning gravel/substrate.
- Long-term improved fish passage to upstream habitats.

With the exception of direct disturbance of fish from equipment/personnel, effects to fish are all a product of habitat-related impacts caused by the proposed action. For this reason, the effects section specifically addresses each pathway of potential effect, primarily focusing on habitat-related impacts and their effects on the species. This is then followed by independent conclusions for each species and designated critical habitat.

The YFSR population of SR spring/summer Chinook and the Upper Salmon River population of SR basin steelhead will be affected by the proposed action. Work may occur during two years, but most effects of each gravel placement (i.e., displacement, sediment deposition, and turbidity) will be temporary. Specifically, plumes will last less than 8 hours per day and occur on four to eight days each season and year (BA page 24). Fish passage improvements are expected to be permanent.

During gravel placement, juvenile SR spring/summer Chinook salmon and steelhead will likely be temporarily displaced, buried, or crushed by equipment as it moves into place or buried by the gravel itself. Juvenile fish density varies from year-to-year and appears positively correlated to the previous year's number of redds - see the BA's Table 5 (page 51), which estimates fish densities and the number of juvenile fish potentially present in the total area affected during spring and summer gravel placements. As described in the status of species, recent adult abundance has been low for both species and juvenile densities are likely skewed to the low end of the available data. Applying the 2021 fish density data from snorkel surveys in the Bonanza Reach, approximately 8 juvenile Chinook and 2 juvenile steelhead may be disturbed during each of the two years of proposed gravel placement. Summer gravel placements will target a larger area of stream than the spring placements (4,641 m<sup>2</sup> vs. 1,190 m<sup>2</sup>) and are expected to affect the majority of fish each year (i.e., approximately 32 Chinook and 8 steelhead). The BA provided estimates for the maximum number of fish affected (107 Chinook and 155 steelhead; page 21), based on years of much higher adult returns. Given the current status of both species, we do not

expect densities to approach the maximum level of potential exposure identified in the BA – supporting our use of more recent fish density estimates.

Proposed best management practices (BMPs) include measures to encourage fish to move out of the disturbed areas before the effects described above occur, and the overall number of individual juvenile fish affected by these pathways is expected to be a small fraction of the fish present before work starts. Actual mortality of juvenile fish is expected to be a very small number of the fish potentially present. Any adult steelhead present during spring gravel placements are expected to flee target areas due to proposed BMPs (i.e., walking through gravel placement areas). Their flight represents a minor behavioral response that does not rise to the level of harm.

Spring gravel placements were strategically designed to utilize the natural energy of the YFSR, on the tail end of the hydrograph, to maximize deposition within the project reach to help seal the channel and minimize transport farther downstream. Similarly, this timing takes advantage of high background turbidity, which both species' juveniles have successfully evolved under. Gravel will be added at three separate sites and turbidity pulses at each site will be close enough in time to (due to small distances between sites) that site pulses will quickly combine and function as a single pulse. BMPs, including frequent turbidity monitoring and controlled releases, are expected to facilitate compliance with Idaho water quality criteria (BA pages 10-11) – likely preventing net turbidity increases of more than 50 nephelometric turbidity units (NTU) above background levels at the measurement point. Turbidity will diminish as the plumes progress through the treatment area, to the compliance point, and then continue to diminish as they progress further downstream (BA page 23). Spring placements will coincide with naturally high turbidity levels – frequently reaching daily maximums of more than 1,200 NTUs (BA, pages 37 and 44) and exceeding 500 NTUs for as many as 23 days in year (2012-2018 data). Summer thunderstorms routinely produce similar high intensity peaks.

Project-induced turbidity increases are likely to lead to minor behavioral changes for exposed fish when background turbidity is low (i.e., summer placements). Because of monitoring, controlled releases, and real-time adjustments, and based on past experience, turbidity will likely not exceed 40 NTUs over background (near zero) at the compliance point. Upstream of the compliance point, turbidity concentrations will probably exceed a 50 NTU net increase immediately downstream of the three discharge sites but pulses will progressively diminish as the plumes progress downstream (BA page 23). Pulses are not expected to be channel spanning until well below the measurement point due to large spring inflow at that point (BA page 23). Effects to fish from summer placements will likely include temporary relocation to unaffected or less affected areas within the action area, with a minor potential for increased predation during fish movement (BA page 23). The small levels of summer turbidity increases, low frequency, and readily available adjacent refugia lead us to conclude summer turbidity levels will not rise to a level harming to exposed fish. Readily adjacent refugia make increased predation risk low and net increases in water quality are too low and brief to have biological impacts on the fish or their habitat.

Spring gravel placements will add up to 50 NTUs to turbidity levels (at the measurement point) that are already high enough to cause a range of potential adverse effects to fish (see BA, pages 23-24). At the compliance point, each pulse will be brief (less than 8 hours) and the magnitude of each pulse will be managed to remain minor relative to typical spring background levels –

approximately 2 to 8 percent increase of the highest (1,300 NTU) and moderate (600 NTU) spring turbidity levels. Net turbidity increases upstream of the compliance point will likely be slightly higher than 2 to 8 percent increase from background. However, the increases are expected to be only marginally higher given the stringent efforts to meet the described compliance standard at Bonanza Bridge just a short distance downstream (0.7 miles). This action-related increase, although minor may still have a small additive effect on adverse effects already occurring to the species under baseline conditions. This effect will occur during each of the four to eight spring placements in 2022 and 2023 and last for approximately 8 hours. Both species' juvenile fish densities are very low in the action area, particularly in the spring. Fish that are present may experience small reductions in survival caused by increased negative physiological responses created by the project-related turbidity increases. For this reason, the effects to both species will be adverse. Fish responding to turbidity increases could also experience elevated predation risk, but this risk is minor as peak intensity plumes will not be channel spanning and the habitat afforded by the recent restoration work allows for close and effective refugia. Because adverse effects to individual fish are caused by the temporary changes to the PBFs (water quality) in the action area, critical habitat for both species will also be temporarily degraded during the individual plumes. No long-term impacts to water quality are expected.

Steelhead incubation starts in mid-March and may extend into mid-June (USBWP 2005) and overlaps with the spring gravel placements proposed. This is also when sediment transport and deposition is naturally occurring (BPA 2022, Figure 7). These are conditions steelhead have successfully evolved under. Although steelhead likely spawn in the mainstem YFSR, there is no redd data available. Few are expected in the Bonanza Project given the small area of habitat relative to the population's entire range. Further, most steelhead likely spawn in smaller tributary streams. Because the spring-placed gravel will be mobilized (mostly throughout the Bonanza Project), some of that material will be deposited on areas where steelhead redds could be located; however, for reasons previously described, few redds/embryos are likely to be exposed.

Sediment deposition on redds is likely to reduce steelhead embryo survival (BPA 2022, pages 21-22; Jenson et al. 2009). For steelhead, reduced embryo survival is substantially tied to increases in fine sediments (i.e., less than 0.034 inches), with survival becoming measurably affected when these sediment levels increase above about 10 percent (BPA 2022, pages 21-22; Jenson et al. 2009). When considering slightly larger sediment sizes (0.19 to 0.25 inches diameter), eyed egg survival remains above 90 percent until fine sediment levels exceed 20 to 25 percent (Jenson et al. 2009). Bonanza Project sediment is very coarse and has almost no fine sediment present in the potential spawning substrate<sup>2</sup>. Although no data exist, levels of very fine-sized sediment are expected to be lower than 10 percent since most of the new channel's bed material consists of dredge tailings, which lack fines altogether. The small quantity of added material (5 percent of the annual average quantity of sediment moving through the project area), including low levels of fines (6.8 percent by weight), is not expected to raise fine sediment levels above the 10 percent threshold known to trigger reduced embryo survival. Although some embryos may experience some adverse effects from the action, the magnitude of effects is expected to be small and limited to spawning areas within the Bonanza Project. For this reason, the action is not expected to have large or widespread effects on steelhead embryo survival, even

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<sup>2</sup> The dearth of fine sediment is the primary reason surface connectivity is currently impaired.

if multiple redds were present in the Bonanza Project. For critical habitat, because spawning gravel will likely experience small levels of additional fine sediment deposition during two steelhead spawning seasons, this PBF may not conserve some individual fish in localized areas and the action's impact is considered adverse.

Sealing the channel in the Bonanza Project reach is expected to improve both species' ability to successfully migrate upstream and downstream. Currently, segments of the action area start to go dry when YFSR flows drop below approximately 28 CFS. In late summer of 2020, project partners added approximately 20 CY of gravel less than one half inch diameter to the streambank and streambed where the only work had been construction of a bypass channel through the dredge tailings. In 2020, up to 9 CFS of water had been leaving the YFSR in this 300-foot long reach. Monitoring completed in 2021 demonstrated almost no water loss in the treated reach – adding confidence that the proposed sealing effort will improve surface connectivity and fish passage. Because several dozen miles of spawning and rearing habitat occur upstream, restoring year-long passage through the Bonanza Reach will provide a large benefit to both species.

All life stages of Chinook salmon will benefit from the ability of adults to reach spawning grounds and for juveniles to access summer rearing habitat (upstream migration) or downstream overwintering habitat (downstream migration). For steelhead, spawning access is not currently impaired and adult spawning distribution will not likely be affected. Juvenile steelhead in the YFSR will experience improved access to summer rearing and downstream overwintering habitat, respectively. Compared to the current environmental baseline, the improved distribution of fish should result in increased growth and survival of future cohorts for both species (due to reduced competition and safe passage to downstream overwintering habitat). For the same reasons, safe passage, a PBF for both species' critical habitat, will also experience beneficial effects from this action and the conservation value of both species' habitat will be improved. No other impacts to safe passage will occur from the action.

Effects to critical habitat PBFs that do not have a direct overlap with adverse effects to the species, but which may be affected by the action are described below. Almost no fine-grained material is present in Bonanza Project reach's substrate – the reason the channel now needs to be sealed. Introduction of up to 320 CY of gravel (between two applications) for two years will have minor impacts on the amount of space, cover, and forage available. The quantity of substrate added annually represents less than 5 percent of the natural bedload and suspended sediment transported through the Bonanza Reach annually. In addition to being a small quantity of material, much of the gravel is expected to fill existing voids in the large cobble substrates, facilitating the desired channel sealing. Some of the added material is also expected to be deposited on point bars and floodplains in the reach, further minimizing the impact to these PBFs. Collectively, these measures are expected to have insignificant reductions in space, cover, and forage within the action area.

Assuming channel sealing is effective, water currently seeping underground and coming back to the channel in the lower reach, will remain in the YFSR through the Bonanza Reach. This may result in minor increases in water temperature downstream of the bridge during summer and fall and a slight cooling of the same area during winter as the thermal influence of the water being underground is reduced. However, water volume through the currently dewatered areas will be exposed to less solar radiation during late summer and fall – likely preventing water from unnaturally warming before it goes underground. Overall, the action's effects on temperature are

expected to be minor and the current cold-water conditions in the YFSR will be maintained at the reach scale with no reduction in the action area's conservation value for this PBF.

“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. The BA (BPA 2022, page 26) concluded there are no known future state or private activities that will occur in the action area with the potential to affect ESA-listed fish that are not already occurring or that have not already been disclosed. For this reason, no effects not already discussed in the environmental baseline were identified.

### **Integration and Synthesis**

The Integration and Synthesis section is the final step in our assessment of the risk posed to species 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, to formulate the agency's biological opinion as to whether the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

As discussed above, no more than two cohorts from each population will be affected and only a small number of fish from each population will likely die from crushing or gravel burial each of the two years the action is implemented. Additionally, the action is expected to cause some reduced steelhead embryo survival if redds are present in the Bonanza Project during the two years spring placement is proposed. Turbidity levels will also temporarily increase for brief periods (~ 8 hours) during each gravel application. For spring applications, increases constitute a small additional negative impact to physiological responses fish are already experiencing under elevated baseline turbidity conditions. This impact will be most pronounced in the 0.7 miles of YFSR between the compliance point and gravel addition sites and continue to decrease downstream. Summer gravel placements will occur when background turbidity is near zero and effective project implementation should keep action-related turbidity levels below 50 NTU – a level expected to produce minor behavioral responses that do not rise to the level of harm or harassment. Displacement from habitat during gravel placement (either from equipment or intentional hazing before gravel is placed may expose some juvenile fish of both species to minor increased predation potential. Fish responding to turbidity increases could also experience elevated predation risk. Predation risk increases are believed to be minor as peak intensity turbidity plumes will not be channel spanning and the habitat afforded by the recent restoration work allows for close and effective refugia from physical or water quality disturbances.

Two year classes of steelhead will likely be exposed to minor levels of reduced embryo survival. Effects will be limited to a very small portion of the Upper Salmon River population's spawning habitat. Considered alone, these effects will not reduce the Upper Salmon River population's abundance or productivity since the effect on embryo survival is expected to be very small and only a small portion of the population will be affected. When added to the very small level of adult and juvenile fish disturbance and very low likelihood of juvenile crushing/burial, the overall population-level abundance and productivity effects will remain small. Turbidity exposures will cause minor behavioral changes to some fish and summer gravel placements may cause some juvenile fish to flee and be exposed to potential predation. Spring turbidity changes

will be less pronounced since they will overlap with high background level, but incremental increases in adverse effects caused by turbidity exposure will be so small and brief, and affect such a small amount of habitat they will not have population level impacts. Because the Upper Salmon River population's viability will not be negatively affected, the action is not expected to reduce the likelihood of survival and recovery of the species. For this reason, the action will not affect the viability of the Salmon River MPG or the SR Basin steelhead DPS as a whole.

Effects on SR spring/summer Chinook salmon will be limited to: (1) very small numbers of juvenile fish being disturbed by equipment and gravel placement; (2) a very low likelihood that a few juvenile fish may be crushed or buried; and (3) juvenile exposure to small increases in turbidity that cause minor behavioral effects to exposed fish and minute increases in adverse effects during spring high flow conditions (similar to those described for steelhead above). All of these effects are small, localized to a small proportion of the Yankee Fork Salmon River population, and are discrete in time. These adverse effects are also limited to just two year classes of fish. Collectively, the described effects are too small to have population level effects on viability and the action will not reduce the likelihood of survival and recovery of the species. Because the Yankee Fork Salmon River population's viability will not be negatively affected, the action is not expected to affect the viability of the Salmon River MPG or the SR spring/summer Chinook salmon ESU.

Long-term beneficial effects to the survival of both species are also anticipated due to improved fish passage through the action area. Increased distribution of adult Chinook salmon and juveniles of both species should allow for increased growth and survival of both species. Elimination of the current fish salvage efforts that have occurred the past two years will also reduce handling-related take and small levels of mortality that have occurred. Increased long-term growth and survival should positively contribute to the recovery and survival of both species.

Action-related increases in turbidity and sediment deposition will cause temporary adverse impacts to spawning gravel and water quality PBFs in the action area. These impacts will affect critical habitat for SR Chinook salmon and SR Basin steelhead. For both PBFs, the impacts are temporary, lasting up to 8 hours on 4 to 8 days annually (turbidity) or one spawning season (steelhead spawning gravel). Although these impacts reduce conservation value of localized habitats within the action area for a small number of individual fish, the condition and value of these PBFs (water quality and substrate) will quickly return to pre-project levels with no long-term impacts on the habitat's ability to support either species. Additionally, the scale of the impacts to these PBFs, relative to the amount and distribution of habitat across each individual population or ESU/DPS, is very minor. The action is proposed to specifically improve safe passage for both species, substantially contributing to conservation value of the action area's critical habitat for SR Chinook salmon and SR Basin steelhead while contributing to their survival and recovery needs. Because adverse effects to two PBFs will be temporary, minor, and very site specific, the action will not reduce the conservation value of critical habitat at the population or ESU/DPS scale for either species.

## **Conclusion**

After reviewing and analyzing the current status of the affected species and their critical habitat, the environmental baseline, the effects of the action and the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion the action is not

likely jeopardize SR Basin steelhead or SR spring/summer Chinook salmon, 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 opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

- Harm to juvenile SR Chinook salmon and SR Basin steelhead from minor potential increased predation risk as a result of fish moving away from habitat affected by temporary and small turbidity increases or instream activity, including the hazing of fish from gravel placement locations.
- Harm to juvenile SR Chinook salmon and SR Basin steelhead from potential crushing by equipment placing material or being buried by gravel.
- Reduced egg-to-fry survival for SR Basin steelhead embryos located in the Bonanza Project reach and affected by minor increased sediment deposition from spring gravel placements.

The distribution and abundance of fish that occur within an action area are affected by habitat quality, competition, predation, and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by the proposed action. Thus, the distribution and abundance of fish within the action area cannot be attributed entirely to habitat conditions. Similarly, NMFS cannot precisely predict the number of fish that are reasonably certain to be harassed, injured, or killed by the proposed action. Because the number of fish adversely affected cannot be directly measured in the field, we use surrogates to describe the extent of incidental take, pursuant to 50 CFR 402.14[I]. The following bullets describe the extent of take for each pathway identified in this opinion and as supported by information provided in the BA (BPA 2022).

- For take caused by exposure from temporary turbidity exposure, the extent of take will be exceeded if any action-related turbidity plume, measured at the Bonanza Bridge, is more than 50 NTU over background levels measured upstream of the proposed work. Turbidity levels are directly related to the displacement-related take anticipated to occur and serve as a useful and sensitive measure to adjust activities or reinitiate consultation if exceeded.
- For fish displaced from habitat or potentially crushed by equipment or buried by gravel, the extent of take will be exceeded if: (1) gravel is directly placed on more than 12,809 square feet of river substrate below the wetted channel during spring placements; (2) if more than 49,256 square feet of substrate are covered by summer gravel placements; or if more than 160 CY of material are placed in the river in either of the two spring or summer additions. The area affected by gravel placements is directly related to the number of fish displaced by hazing or harmed by gravel placement or equipment accessing the area.
- For steelhead embryos affected by spring gravel placements, the extent of take will be exceeded if: (1) more than 160 CY of gravel are placed in the target area between March 1 and July 7 of 2022 or 2023; or (2) if action-related turbidity increases measured at the Bonanza Bridge are more than 50 NTU over background levels measured upstream of the project work. Both the quantity of gravel placed in the stream and the resultant turbidity levels are directly related to the small levels of reduced embryo survival that may occur. In the field, there is no way to measure the number of embryos actually affected by the action or actual effects to individual embryos that may be present.

Although the surrogates are partially coextensive with the proposed action, monitoring during project implementation will provide opportunities to check whether these surrogates have been exceeded. As such, the surrogates will function as effective reinitiation triggers.

### **Effect of the Take**

In the 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 the species.

### **Reasonable and Prudent Measures**

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

The BPA, COE, BOR, SCNF, and all applicants shall:

1. Monitor the construction to ensure that it conforms to all design specifications and implements BMPs, including all proposed mitigation measures and to ensure the extent of take is not exceeded; and,
2. Minimize incidental take from harassment, displacement, and sediment-related effects caused by gravel placement.



## Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency and all applicants must comply with the following terms and conditions. The BPA, COE, BOR, SCNF, and all applicants have 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 reasonable and prudent measure (RPM) 1:
  - a. The applicant must report all monitoring items within 30 days of completing each spring and summer phase to Snake River Basin Office email ([nmfswcr.srbo@noaa.gov](mailto:nmfswcr.srbo@noaa.gov)) and to [chad.fealko@noaa.gov](mailto:chad.fealko@noaa.gov). Reports shall include:
    - i. Verification (photo or other reporting) that all proposed BMPs and conservation measures, including all proposed mitigation measures were successfully implemented.
    - ii. Turbidity monitoring data demonstrating that action-related turbidity pulses, measured at Bonanza Bridge, did not exceed a 50 NTU net increase above background turbidity levels measured immediately below the Jordan Creek confluence.
    - iii. Results of any steelhead redd monitoring performed in the action area during the two years the action would occur.
    - iv. Verification (photos and/or physical measurements) that: (1) summer gravel is not directly placed on more than 49,256 square feet of river substrate below the wetted channel; (2) spring gravel placements do not directly cover more than 12,809 square feet of substrate; (3) that no spring or summer gravel placement discharged more than 160 CY of material; and (4) all gravel placed in the YFSR contained no more than 6.8 percent fines less than 0.003 inches diameter by weight.
    - v. Summary of the dates, location, quantity, and size of gravel material placed and description of how material was placed.
2. The BPA, COE, SCNF, BOR, and any applicants shall implement the following terms and conditions, which implement RPM 2:
  - a. Prior to discharging gravels in live-water, and to the degree safety allows, all areas targeted for gravel placement shall be waded through multiple times to encourage as many fish as possible to temporarily leave the target placement areas.

- b. All gravel placed in the YFSR shall be confirmed to contain less than 6.8 percent fines less than 0.003 inches diameter by weight.

### **Conservation Recommendations**

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

1. The BPA, COE, SCNF, BOR, and any applicants should continue to monitor fish passage through the Bonanza Project post-project implementation and collaborate with NMFS and other partners on additional actions in the event fish passage remains compromised.

### **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 involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of incidental taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the 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.”

### **Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response**

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. This analysis is based, in part, on the EFH assessment provided by the BPA and descriptions of EFH for Chinook salmon Fishery Management Plan for Pacific Coast salmon (PFMC 2014). Habitat areas of particular concern (HAPCs) that will be affected include spawning habitat and complex channel and floodplain habitat. Based on the previous discussion of the action’s effects on critical habitat, which are incorporated by reference here, we determined the following adverse effects to EFH will occur:

1. Temporary reductions in water quality (i.e., turbidity) downstream of gravel placement areas. Effects will last less than 8 hours and occur four to eight times annually for two years. Baseline water quality conditions will return immediately after turbidity subsides and no long-term effects are expected.
2. Spawning gravel downstream of gravel placements areas will experience minor levels of increased fine sediment. Deposition will occur outside of Chinook spawning periods and

the quantity of sediment deposited is not expected to be sufficient in quantity or extent to reduce this HAPCs ability to support Chinook salmon spawning.

NMFS determined that the following EFH Conservation Recommendation is necessary to avoid, minimize, mitigate, or otherwise offset the impact of the proposed action on EFH.

1. All gravel placed in the YFSR should be confirmed to contain less than 6.8 percent fines less than 0.003 inches diameter by weight.

Fully implementing this conservation recommendation would protect, by avoiding or minimizing the adverse effects described above, EFH for Pacific Coast salmon. As required by section 305(b)(4)(B) of the MSA, the BPA must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative timeframes for the Federal agency response. The response must include a description of the measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects [50 CFR 600.920(k)(1)].

The BPA 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 opinion and MSA consultation 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' Snake River Basin Office.

Please direct questions regarding this document to Chad Fealko, Salmon Field Office at 208- 768-7707.

Sincerely,



Michael P. Tehan  
Assistant Regional Administrator  
Interior Columbia Basin Office

cc: S. Fisher - USFWS  
C. Colter – SBT  
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M. Knutson – BOR  
J. Joyner – COE  
I. Duran – BPA  
B. Gamett - SCNF  
C. Wood – TU

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