

not possible, it is reasonably likely that those effects within the action area will have a moderate, long-term adverse effect on the likelihood that these ESA-listed species will survive and recover, and a moderate, long-term negative effect on the conservation role of critical habitat units.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step of NMFS' 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 (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5) to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Result in appreciable reductions in the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution (jeopardy analysis); or (2) reduce the value of designated or proposed critical habitat for the conservation of the species (adverse modification analysis). These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).

The USFS and BLM have proposed to conduct up to 156 stream crossing replacement and/or removal actions across an action area involving 16 USFS and BLM administrative units within the State of Idaho. Additionally, the COE will issue permits under section 404 of the CWA for these stream crossing replacement and/or removal projects.

The adverse effects resulting from the proposed project are expected to be of limited extent (<600 feet) and temporary (less than 2 weeks annually for individuals and less than 6 months for critical habitat). The direct construction impacts are limited to the construction area. Lethal impacts would result from capture, handling, transport, and stranding of fish during worksite isolation. Construction-related short-term increases of sediment could result in sublethal effects to migrating sockeye salmon, and/or rearing spring/summer Chinook salmon and steelhead immediately downstream of project sites. Increased suspended sediment from project construction activities could affect all species of fish within 600 feet of individual projects. Exposed fish are likely to experience a temporary (<2 hour) reduction in feeding rates, and increased occurrences of avoidance responses, abandonment of cover, or alarm reactions. Immediately following channel rewatering and lasting for approximately 1.5 hours, sediment levels will peak nearly instantaneously and then steadily improve. The highest sediment intensities may result in physiological stress, moderate habitat degradation, and impaired homing ability.

These effects may be overstated as juveniles within 600 feet are likely to migrate away from the highest turbidity levels, seeking more favorable conditions downstream and thereby avoiding the highest levels of sublethal effects. As sediment levels improve, the effects decrease from moderate physiological stress, to increased rates of coughing and respiration rates, to minor physiological stress. All these effects can be considered to 'harm' fish exposed to these conditions and temporarily degrade fish habitat rearing capacity for the 1.5 hours of exposure. Fish will then be exposed to sediment levels that elicit an insignificant behavioral response for up to 22 additional hours. No lethal take would be expected to occur as a result of sediment

exposure. Conservative estimates of fish densities and implementation of effective conservation measures are expected to result in both fewer fish actually harmed and lower levels of actual harm. Project timing designed to avoid times when adults will be present instream should prevent any negative effects of the action on spawning activities. Similarly, conservation measures designed to avoid impacts to downstream redds should preclude any adverse effects to egg development success.

In the effects analysis, NMFS estimated that implementation of the programmatic action is estimated to result in approximately 203 fewer spring/summer Chinook salmon smolts being produced from the ESU each year, resulting in 1.8 fewer adult spring/summer Chinook salmon returning to the action area on an annual basis. For steelhead, 103 fewer steelhead smolts would be killed annually, resulting in less than one (0.83) fewer adult steelhead returning to the action area each year the project is in place.

Even though the estimated loss of two spring/summer Chinook salmon and one steelhead per year is measurable, NMFS does not believe it is likely to appreciably reduce the likelihood of survival or recovery of the Snake River spring/summer Chinook ESU or the Snake River Basin steelhead DPS because the projected loss is small in comparison to the total population and ESA-listed species numbers. The projected number of lost adults will not jeopardize any of the 21 Snake River spring/summer Chinook salmon populations or the 17 Snake River Basin steelhead populations. Since the projects are anticipated to be well distributed across the action area, no one population will be exposed to the loss of more than one individual adult spring/summer Chinook salmon or adult steelhead and most will not result in the loss of any adult fish.

No provisions for handling of Snake River sockeye salmon individuals are included in the proposed programmatic action, and no impeding of sockeye salmon migration is permitted. Within sockeye salmon migratory habitat, only single-span bridges, supporting abutments, and construction activities must all be positioned above the high-water mark. For these reasons, no activities that could result in lethal take or salvage of sockeye salmon are expected or addressed in this Opinion.

When assessing the potential for adverse modification or destruction of designated critical habitat, NMFS considers the effects of the proposed action upon the PCE's described in Table 8 of this Opinion. NMFS believes it is reasonably likely that implementation of the proposed action will cause some small, local, short-term impairment to some PCEs in the action area due to temporary sediment impacts to substrate and salmonid food sources from the time of project completion until the next peak discharge (<6 months). Temporary pulses of sediment and turbidity plumes are expected to cause small increases in downstream sediment deposition (increased surface fines), negatively affecting substrate in the short-term. Operation of heavy equipment in or near the stream channel elevates the risk for accidental fuel and oil contamination of the aquatic environment within the action area although design criteria in the proposed action will reduce the risk to discountable levels.

Sediment-related impacts are not expected to result in long-term reduction of designated critical habitat value for spring/summer Chinook salmon, sockeye salmon, and/or steelhead. Immediately following project completion and into the long-term; however, some critical habitat PCEs including water quality, substrate, forage, riparian vegetation, access (barriers) and floodplain connectivity should all experience some beneficial effects due to implementation of the proposed action. The overall conservation value of affected critical habitats should be improved with improved passage conditions, increased floodplain function, reduced channel instability (downcutting), improved riparian condition, and a substantial increase in available habitat that is currently unavailable or underutilized.

Removal of undersized crossings should reduce chronic sediment delivery at project sites while also removing the risk of catastrophic sediment inputs associated with road crossing failures. Decreased maintenance levels, reduced risk of crossing failures, and improved hydrologic function at individual sites will reduce sediment inputs, and improve water quality and substrate condition within rearing and spawning habitats. Removing barriers and installing stream simulation crossings will increase access to fish habitat and provide additional productivity that benefits forage species as well as ESA-listed fish. Removal of some stream crossings should improve local riparian and floodplain processes. In the long term, the action area's water temperature may also improve, as problematic sediment sources are stabilized, and riparian structure and function improve. Habitat improvements and the increased availability of fish habitat within the action area over time are expected to increase the potential for survival and recovery of the ESA-listed species discussed in this Opinion.

2.7. Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the Snake River spring/summer Chinook salmon ESU, the Snake River sockeye salmon ESU, the Snake River Basin steelhead DPS considered in this Opinion, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of these species. Similarly, based on a review of the best available scientific and commercial information regarding the status of the designated critical habitat for Snake River spring/summer Chinook salmon, Snake River sockeye salmon, Snake River Basin steelhead considered in this Opinion, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, NMFS concludes that the action, as proposed, is not likely to result in the destruction or adverse modification of designated critical habitat for these species.

2.8. Incidental Take Statement

Section 9(a)(1) of the ESA prohibits the taking of listed species without a specific permit or exemption. Protective regulations adopted pursuant to section 4(d) extend the prohibition to threatened species. Among other things, an action that harasses, wounds, or kills an individual of

an ESA-listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). Incidental take refers to 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(o)(2) exempts any taking that meets the terms and conditions of a written ITS from the taking prohibition.

An ITS specifies the impact of any incidental taking of endangered or threatened species. It also provides RPMs that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the RPMs.

2.8.1. Amount or Extent of Take

NMFS anticipates that the proposed action considered in this Opinion is reasonably certain to result in the incidental take of some ESA-listed species through habitat-related harm. NMFS also expects those actions within occupied habitat (as defined in the Opinion) would result in an additional amount of harm and/or death. The proposed action is designed to avoid locations where ESA-listed adult fish are actively spawning, where spawning is imminent, where adults are currently present, or where spawning redds are active. Due to the life history of the ESA-listed species considered in this Opinion and complications in otherwise limiting take by managing project timing, take of adult spring/summer Chinook salmon, steelhead, sockeye salmon, or take of any of their embryos are not authorized in this Opinion.

Take associated with the habitat-related harm caused by programmatic actions is not expected to be measurable as long-term effects on populations. However, increased levels of suspended and deposited sediment from project construction activities are expected to cause both direct and indirect effects to juvenile fish up to 600 feet downstream of the dewatered area, at individual project sites within 'occupied habitats.' NMFS estimated that annually, approximately 24,166 spring/summer Chinook salmon and 16,794 juvenile steelhead could be affected by increased suspended sediment levels to some degree. These individuals are likely to experience a range of effects including the following:

1. Short-term (<2 hour) reduction in feeding rates, avoidance response, abandonment of cover or an alarm reaction. These responses will be present due to expected suspended sediment levels ranging between normal background levels and approximately 35 mg/l. These effects constitute insignificant behavioral modifications and are not considered to have resulted in 'take' to the exposed individuals.
2. Within 600 feet downstream of the work site and for approximately 1.5 hours (following stream rewatering), sediment levels are expected to rapidly peak and then steadily decrease in intensity. Effects are expected to decrease with the decreasing sediment intensity. Effects will range from indicators of major physiological stress to moderate habitat degradation and impaired homing to minor physiological stress and increased rates of coughing and respiration. During this time (1.5 hours) the expected maximum suspended sediment levels are 15,588 mg/l immediately after diversion removal and

approximately 100 mg/l 1.5 hours later. Effects associated with these levels are considered 'sublethal' to exposed individuals but are still considered 'take' under the ESA. Suspended sediment levels during this time period and within the 600 feet of affected habitat will temporarily degrade critical habitat rearing capacity. The incidental take from suspended sediment related effects authorized by this Opinion is limited to sublethal effects lasting no longer than 1.5 hours after rewatering of the construction site and effects not extending greater than 600 feet downstream of any individual worksite.

3. For up to 22 hours after effects described in number two above, the fish are likely to be exposed to sediment levels that elicit a behavioral response similar to number one above. Suspended sediment levels are expected to steadily decrease from an approximate maximum of 100 mg/l to background levels. These effects will be present within the same 600 feet of channel but are not considered 'take' under the ESA as the behavioral response is considered to be insignificant.
4. No lethal take is expected to occur as a result of habitat-related effects as suspended sediment levels are not expected to exceed 22,026 mg/l at any time.

Because of proposed BMPs, migrating sockeye salmon could be also exposed to construction-related turbidity. However, because activities in migratory sockeye salmon will be infrequent, and fish will be migrating through project areas, NMFS was not able to estimate how many sockeye salmon could be affected by project activities. However, because no inwater work or dewatering of the channel will occur on projects within migratory sockeye habitat, turbidity impacts to sockeye salmon will be limited to harm and will be sublethal in nature.

It is clear that turbidity measurements are not appropriate surrogates for total suspended solids in all cases, and that many other factors can affect turbidity measurements other than suspended sediment levels. We also know that the relationship between turbidity and suspended sediment varies between watersheds and even between different locations within the same watershed (Henley et al. 2000). However, turbidity is less difficult and more economical to measure than suspended sediment when NTUs are not exceptionally high, and some studies (Dodds and Whiles 2004) show high statistical correlations between the two parameters. Most of the time turbidity measurements take 30 seconds, can be done on site, and therefore allow for rapid adjustments in project activities if turbidity approaches unacceptable levels. Monitoring shall verify NTU values meet Idaho state water quality standards for NTUs (50 NTU instantaneous over background levels [IDEQ n.d.a]) 600 feet downstream of the project within 1.5 hours of site re-watering. Literature reviewed in Rowe et al. (2003) indicated that NTU levels below 50 generally elicit only behavioral responses from salmonids thereby making this a suitable interim surrogate for sublethal incidental take monitoring.

Other than in migratory sockeye salmon habitat, projects occurring in habitat occupied by ESA-listed species are required to dewater the project work area during stream crossing or replacement/removal activities. The dewatering of these sites requires that ESA-listed fish be

removed from the work site. The proposed action results in various levels of take ranging from harassment, handling, stress, injury and mortality. Adults of the ESA-listed species considered in this Opinion will not be affected by dewatering activities.

NMFS estimated the total number of fish that may be handled, hazed, injured, killed or otherwise harmed during the dewatering of individual project work sites in Section 2.4.1.6., Table 11. Results of that analysis are reported below. Implementation of the proposed action may result in up to 1,761 spring/summer Chinook salmon parr, 387 steelhead parr and 774 steelhead fry being hazed, dip-netted, handled and electrofished annually. All of this handling is considered to be non-lethal 'take' under the ESA. Any exceedance of these values is not authorized under this ITS.

Use of electrofishing to salvage fish from proposed work areas is likely to cause annual incidental mortality of up to nine spring/summer Chinook salmon parr, one steelhead parr and two steelhead fry across the analysis area. Stranding of individual fish during dewatering of construction sites is likely to cause the largest proportion of fish mortality under the proposed action. NMFS calculated that approximately 398 spring/summer Chinook salmon, 103 steelhead parr and 207 steelhead fry may be stranded and killed each year the programmatic consultation is in place. Therefore, the total lethal take associated with implementation of the proposed action is limited to 407 spring/summer Chinook salmon, 104 steelhead parr, and 209 steelhead fry. The total expected take is based on the maximum number of projects that may be implemented in any year this programmatic consultation is in place as well as the distribution of ESA-listed anadromous fish within the action area. The provided estimate is considered to be a worst case scenario as all assumptions NMFS applied in the calculations were believed to be conservative and thus have a tendency to overestimate the actual take that may occur.

No activities that could result in lethal take or salvage of Snake River sockeye salmon are authorized in this Opinion. Therefore, no estimate of lethal take of Snake River sockeye salmon is provided in this Opinion. Similarly, because Snake River fall Chinook are not expected to occur where proposed programmatic activities will be implemented, no calculation for incidental lethal take of this species is included in this Opinion.

Monitoring of annual take is critical to ensure that all assumptions used to develop this take statement are accurate and that the action agencies do not exceed the amount of take authorized. Post project monitoring reports (Appendix B) for all projects completed in "occupied" habitat shall be completed and submitted to NMFS, Idaho State Habitat Office, within 4 weeks of individual project completions. If at any time the level or method of take exempted from take prohibitions and quantified in this Opinion is exceeded, reinitiation of consultation is required.

2.8.2. Reasonable and Prudent Measures

The RPMs are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The USFS, BLM, and COE have the continuing duty to regulate the activities covered in this ITS where discretionary Federal

involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the USFS, BLM, or COE fails to exercise their discretion to require adherence to terms and conditions of the ITS, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the ITS, protective coverage may lapse.

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

The USFS, BLM, and COE shall implement the following RPMs:

1. Minimize incidental take by appropriate consideration of alternative project designs and implementation methods.
2. Minimize incidental take that occurs as a result of programmatic project implementation.
3. Ensure completion of appropriate monitoring and timely reporting to confirm that projects implemented under this Opinion are meeting objectives of the programmatic consultation and are also not exceeding the amount and/or extent of take from permitted activities.

2.8.3. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the USFS, BLM, COE, and their cooperators, including the applicant, if any, must fully comply with conservation measures described as part of the proposed action and the following terms and conditions that implement the RPMs described above. Incomplete compliance with these terms and conditions would invalidate this take exemption.

1. To implement RPM #1 (project design and implementation), the USFS, BLM, and COE shall ensure that:
 - a. Stream channel simulation design skills are readily accessible to PDTs and Level 1 Teams and are implemented consistently across the action area.
 - b. The PDTs seek input from Level 1 Teams during design process and during pre-project reviews and remain flexible in the design process in order to adapt to various and unique site conditions and ensure the likelihood that completed projects meet programmatic objectives.

- c. New crossing structures are greater than bankfull width where the PDT or Level 1 consensus determines that: (1) It may be necessary to pass debris; (2) it may be necessary to minimize effects to meander pattern in low gradient channels; or (3) other site-specific conditions dictate an increased width.
2. To implement RPM #2 (Minimization of take as a result of programmatic project implementation), the USFS, BLM, and COE shall ensure that they:
- a. Implement the following BMPs in addition to implementing all programmatic activities consistent with the design criteria, activity types, prohibited projects and mitigation measures presented in the proposed action:
 - (1) Minimize extent of riparian clearing activities (especially during site preparation, excavation and diversion channel construction). Disturbance levels shall be minimized to the extent possible, but will not include removal of more than three trees greater than 8 inches dbh without prior approval from appropriate Level 1 Team. Replacement trees of the desired species will be planted as part of site rehabilitation.
 - (2) Implement the design criteria F6a described in Appendix C, 'Minimize Site Preparation Impacts', where maintenance activities are implemented.
 - (3) Limit potential take and channel disturbance from live channel stream crossings during site excavation and maintenance construction phases. Ensure that fish are cleared from the area and the site is dewatered prior to any mechanical stream crossing in 'occupied' habitat.
 - (4) Abutments for bridge replacement projects in migratory sockeye salmon habitat shall either be constructed above the ordinary high water mark or constructed at a time when water levels recede to the point that work can be completed in the dry. No dewatering or isolation of work areas around abutments is authorized in migratory sockeye salmon habitat.
 - (5) Do not dewater work areas and/or salvage fish in stream channels in sockeye salmon migratory habitat so that sockeye salmon migration is not impacted and no sockeye salmon are subjected to fish handling activities.
 - (6) Reduce the potential number of fish hazed, captured, handled, or electrofished during fish salvage operations by reducing streamflow *prior* to fish salvage operations at all sites (including electrofishing sites).
 - (7) When reducing flow during the dewatering phase, approximately 80% of streamflow should be rapidly removed to encourage the greatest degree of volitional movement from the project site. Any alternative dewatering approach

must receive approval from the appropriate Level 1 Team. Team approval shall determine that the alternative method is consistent with the intent of this Opinion and the anticipated level of take will not be exceeded.

- (8) Fish salvage shall proceed from the least invasive method to most invasive. Seine nets will first be walked down the proposed dewatered area to 'herd' fish out of all project sites after initial dewatering. Dip-netting of stranded fish in isolated pools will occur next, and electrofishing efforts (where determined necessary by the PDTs) will proceed last.
 - (9) Electrofishing (where utilized) will be conducted with a three pass method to ensure the greatest level of fish salvage unless previously approved by the appropriate Level 1 Team to perform more or fewer passes.
 - (10) Ensure that holding conditions for any transported fish provide the lowest level of stress to captured individuals by maintaining local stream conditions (temperature, dissolved oxygen, etc.) in holding tanks, minimizing holding time and avoiding any predation in holding vessels.
 - (11) Release all transported fish to a safe location as quickly as possible. Fish release upstream of the project site is preferred as sediment impacts would not likely affect individuals upstream of the crossing.
 - (12) Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
 - (13) The guidelines found at http://swr.nmfs.noaa.gov/pdf/Treated%20Wood%20Guidelines-FINALClean_2010.pdf shall be used for any installation of treated wood.
- b. Survey all proposed ford sites prior to design and implementation to ensure no potential spawning habitat for ESA-listed species is present.
 - c. Provide Level 1 Teams with a written rationale statement (attached to pre-project checklist) supporting any determination that overall impacts to stream channels will be reduced at crossing sites proposed for conversion to a ford.
- 3. To implement RPM #3 (monitoring and reporting), the USFS, BLM, and COE shall ensure that:
 - a. All captured, handled and killed ESA-listed fish shall be identified, counted and reported on the 'post-project checklist' (Appendix B).
 - b. The Action Agencies shall seek to implement the proposed suspended sediment monitoring as described in the proposed action (Section 1.3.4.3). Since it is unlikely that

the coordinated monitoring plan will be implemented immediately, the action agencies shall implement an interim monitoring effort utilizing NTU measurements until the proposed monitoring program is implemented. A reasonable sample of projects (at least one per administrative unit per year) implemented under this consultation will be assessed to assure that the incidental take associated with suspended sediment and exempted in this Opinion has not been exceeded. Monitoring will assess the duration and intensity of turbidity to verify the extent of take exempted in this ITS (Section 2.8.1). The NTU values shall not exceed the Idaho water quality turbidity standard (50 NTUs instantaneous over background [IDEQ n.d.a]) 1.5 hours after site rewatering. The interim monitoring effort will be necessary until the action agencies' suspended sediment monitoring proposal becomes operational.

- (1) NTUs will be recorded at the following locations: (a) Above the project work site; (b) immediately downstream of the project worksite; and (c) approximately 600 feet downstream of the project worksite.
- (2) NTU measurements shall be recorded at the following times: (a) Prior to rewatering of the worksite; and (b) at 30 minute intervals after rewatering begins.
- (3) Monitoring of NTUs shall continue until values have decreased below the state NTU standard (IDEQ n.d.a) or for 4 hours, whichever is achieved first.

If the results of any monitoring effort indicate that the extent of take may have been exceeded, then the action agencies shall coordinate with the Interagency PDT to determine if further action or additional monitoring efforts may be necessary.

- c. All monitoring results are submitted with that projects 'post-project' checklist (Appendix B) is submitted within 4 weeks of project completion for all projects completed under this programmatic consultation.
- d. 'Pre- and post-project checklists' and results of suspended sediment monitoring are reported via the NMFS Public Consultation Tracking System (PCTS) IV online forum when it becomes available.

If the PCTS IV system is not available at the time reports are due submit the 'post-project checklist' to:

Idaho State Director
Habitat Conservation Division
National Marine Fisheries Service
10095 W Emerald St.
Boise, ID 83704

- e. **NOTICE:** If a sick, injured or dead specimen of a threatened or endangered species is found in the project area, the finder must notify NMFS through the contact person identified in the transmittal letter for this Opinion, or through Idaho State Habitat Office of NMFS Law Enforcement at (208) 321-2956, and follow any instructions. If the proposed action may worsen the fish's condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (1) NMFS consultation number; (2) the date, time, and location of discovery; (3) a brief description of circumstances and any information that may show the cause of death; and (4) photographs of the fish and where it was found. NMFS also suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

2.9. 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 threatened and endangered species. The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the USFS, BLM, and COE:

1. The PDTs should critically review the use of riprap on new structures, minimizing its use to the smallest extent reasonable to provide stability of the structure and ensure fish habitat is maintained or improved.
2. To mitigate the effects of climate change on ESA-listed salmonids, follow recommendations by the ISAB (2007) to plan now for future climate conditions by implementing protective tributary and mainstem habitat measures; as well as protective hydropower mitigation measures. In particular, implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and to ensure late summer and fall tributary streamflows.
3. The USFS and BLM should work closely with the Level 1 Teams and incorporate results of completed watershed level consultation and work plans consistent with the LRMP and LUP within each Forest or BLM unit when selecting and prioritizing stream crossing removal or replacement projects.
4. The PDT should consider design options that would allow for beneficial effects to all matrix pathways and indicators, and move them towards the desired PFC.

5. The USFS and BLM are encouraged to replace trees that are removed from the riparian area on a 2:1 ratio with appropriate native species for the site to hasten riparian recovery.
6. The USFS and BLM should monitor and assess the effectiveness of each project for expanding habitat access and utilization by ESA-listed fish.

Please notify NMFS if the USFS, BLM, or COE carries out any of these recommendations so that we will be kept informed of actions that minimize or avoid adverse effects, and those that benefit species or their habitats.

2.10. Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law, and: (a) If the amount or extent of taking specified in the ITS is exceeded; (b) if new information reveals effects of the action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the ESA-listed species or critical habitat that was not considered in the Opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

If the USFS or BLM fail to submit the specified monitoring information within 4 weeks of the completion of any project site completion in 'occupied habitat,' NMFS will consider that a modification of the action has occurred which will require reinitiation of consultation. The USFS, BLM and COE shall reinitiate consultation if annual take reporting indicates that the level of take authorized under this Opinion has been exceeded. To reinitiate consultation, contact the Habitat Conservation Division (Idaho Habitat Branch) of NMFS, and reference P/NWR/2012/05875, 05876, or 05877.

2.11. "Not Likely to Adversely Affect" Determinations

The previous discussion has focused on the proposed action's potential adverse effects to Snake River spring/summer Chinook salmon, Snake River sockeye salmon, Snake River Basin steelhead, and designated critical habitat for these species within the action area. The action agencies also determined the proposed action "May Affect, but is "Not Likely to Adversely Affect" Snake River fall Chinook salmon and their designated critical habitat. NMFS concurs with the NLAA determinations for Snake River fall Chinook salmon and Snake River fall Chinook salmon designated critical habitat.

Programmatic activities will not occur where Snake River fall Chinook salmon are present, and project design criteria effectively reduces the potential to impact any individuals that may be found downstream of project sites. Designated critical habitat for Snake River fall Chinook

salmon would not be adversely affected by the proposed action since programmatic activities are not expected to occur within these habitats due to a lack of road crossings in these mainstem habitats.

3. MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirement of section 305(b) MSA directs Federal agencies to consult with NMFS on all actions, or proposed actions that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations 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 to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council (PFMC) designated EFH for Chinook and coho salmon (PFMC 1999). The proposed action and action area for this consultation were previously described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook and coho salmon (PFMC 1999). The effects of the proposed action on EFH are as follows.

The effects on Chinook and coho salmon EFH are the same as those for Snake River spring/summer Chinook critical habitat and are described in detail in the Effects of the Action sections of this Opinion. The proposed action may result in short-term adverse effects on a variety of habitat parameters as well as immediate and long-term benefits to others. These effects are:

1. **Water Quality.** Water quality in the action areas may be temporarily reduced due to increased turbidity from construction activities. This could negatively affect juvenile feeding until the channel and structures are fully stabilized. Removal/replacement of undersized crossings may reduce ongoing sedimentation and channel scouring thus reducing sediment levels and improving water quality over the long term. Operation of heavy equipment in or near the stream channel elevates the risk for accidental fuel and oil contamination of the aquatic environment within the action area although design criteria in the proposed action are expected to reduce the risk to discountable levels. In the long term, the action area's water temperature quality may improve, as problematic sediment sources stabilize and riparian structure and function improve.
2. **Substrate.** Temporary pulses of sediment and turbidity plumes are expected to cause small increases in downstream sediment deposition (increased surface fines), negatively affecting substrate in the short term. However, any deposited sediments liberated during project activities are expected to be entrained during the next channel adjusting discharge. Increased surface fines are not expected to persist beyond 6 months. Due to design

criteria to avoid redds and limit the sediment introduced and thus deposited, this temporary increase is not expected to be significant. Further, these sediment levels are considered to be negligible in relation to the annual sediment load during peak discharge. Removal/replacement of undersized culverts should reduce chronic sedimentation and eliminate adverse channel adjustments associated with undersized crossings (downcutting). Additionally, the long-term risk of culvert failures and associated channel scouring events should be decreased with project implementation.

3. **Cover/Shelter.** Cover/shelter may be slightly and temporarily negatively affected due to increases in turbidity and sediment deposition during project construction activities. Overhead cover provided by riparian vegetation is not expected to change in the short term since the amount of riparian vegetation that could be removed is considered insignificant in the context of subwatersheds. Use of riprap within project sites may incrementally reduce the rearing quality of habitat at the sites for a distance up to 38 feet per site. Site rehabilitation efforts will encourage riparian recovery over the long term. Pool habitat quality is not expected to be impaired by project activities.
4. **Food.** Increases in turbidity and sedimentation may temporarily reduce macroinvertebrate communities within the turbidity plume downstream of (<600 feet) individual project sites. However, increased stability of the stream channel due to stream simulation designs and reduced chronic sediment loads may positively affect macroinvertebrate communities in the affected watersheds over the long term.
5. **Riparian Vegetation.** Removal of stream crossings should increase the potential riparian vegetation and improve riparian function. Although stream simulation replacement culverts will continue to restrict riparian function at crossing locations, decreased channel instability is likely to improve riparian function downstream of sites. Clearing of vegetation within individual project work sites is expected to have a short-term reduction in riparian presence. Rehabilitation efforts will ensure that riparian function is restored or improved in the long term.
6. **Access.** Passage at project sites will continue to be impaired at project sites during construction activities. Following completion of individual projects, passage should be restored at treated sites. This is an overall improvement to fish passage.
7. **Floodplain Connectivity.** Floodplain connectivity will be improved at stream crossing removal sites but will continue to be impaired at replacement sites. Stream simulation design is likely to improve channel function at these sites though and floodplain connectivity may be improved where drastically undersized culverts previously existed.

3.1. EFH Conservation Recommendations

NMFS believes that the implementation of the five conservation recommendations, the three RPMs and associated Terms and Conditions provided in Sections 2.6, 2.8.2 and 2.8.3 of the

above Opinion are adequate to ensure conservation of EFH within the action area. These recommendations are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH. These Conservation Recommendations are a non-identical subset of the ESA Terms and Conditions that NMFS believes are consistent with this obligation and therefore should be carried out by the USFS, BLM, and COE:

NMFS also believes that the following conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH:

1. Stream channel simulation design skills should be made readily accessible to PDTs and Level 1 Teams to make sure they are implemented consistently across the action area.
2. The PDTs should seek input from Level 1 Teams during the design process and pre-project reviews; and should remain flexible in the design process in order to adapt to various and unique site conditions and to ensure the likelihood that completed projects meet programmatic objectives.
3. New crossing structures should be greater than bankfull width where the PDT or Level 1 consensus determines that: (1) It may be necessary to pass debris; (2) it may be necessary to minimize effects to meander pattern in low gradient channels; or (3) other site-specific conditions dictate an increased width.
4. In addition all project design criteria, activity types, prohibited projects, and mitigation measures presented in the proposed action, the following BMPs should be implemented:
 - a. The extent of riparian clearing activities should be minimized (especially during site preparation, excavation, and diversion channel construction). Disturbance levels should be minimized to the extent possible, but should not include removal of more than three trees greater than 8 inches dbh without prior approval from appropriate Level 1 Team. Replacement trees of the desired species should be planted as part of site rehabilitation.
 - b. Project design criteria F6a should be implemented as described in Appendix C, 'Minimize Site Preparation Impacts', where maintenance activities are implemented.
 - c. Potential take and channel disturbance from live channel stream crossings should be limited during site excavation and maintenance construction phases.
 - d. Project operations should cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
 - e. All proposed ford sites should be surveyed prior to design and implementation to ensure no potential spawning habitat for ESA-listed species is present.

- f. Level 1 Teams should be provided with a written rationale statement (attached to pre-project checklist) supporting any determination that overall impacts to stream channels will be reduced at crossing sites proposed for conversion to a ford.
5. The Action Agencies should seek to implement the proposed suspended sediment monitoring as described in the proposed action (Section 1.3.4.3). Since it is unlikely that the coordinated monitoring plan will be implemented immediately, the action agencies should implement an interim monitoring effort utilizing NTU measurements until the proposed monitoring program is implemented. A reasonable sample of projects (at least one per administrative unit per year) implemented under this consultation should be assessed. Monitoring should assess the duration and intensity of turbidity. The NTU values should not exceed the Idaho water quality turbidity standard (50 NTUs instantaneous over background [IDEQ n.d.a]) 1.5 hours after site rewatering. The interim monitoring effort will be necessary until the action agencies' suspended sediment monitoring proposal becomes operational.
6. NTUs should be recorded at the following locations: (a) Above the project work site; (b) immediately downstream of the project worksite; and (c) approximately 600 feet downstream of the project worksite.
7. NTU measurements should be recorded at the following times: (a) Prior to rewatering of the worksite; and (b) at 30 minute intervals.
8. Monitoring of NTUs should continue until values have decreased below the state NTU standard (IDEQ n.d.a) or for 4 hours, whichever is achieved first.

3.2. Statutory Response Requirement

As required by section 305(b)(f)(B) of the MSA, Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation from NMFS. 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 agencies have agreed to use alternative timeframes for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response is inconsistent with NMFS conservation recommendations, the Federal agencies must explain their 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)].

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how

many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.3. Supplemental Consultation

The USFS, BLM, and COE 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)].

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act [DQA]) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these DQA components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users.

This ESA and EFH consultation concludes that the Stream Crossing Structure Replacement and Removal Activities Programmatic action will not jeopardize the affected ESA-listed species. Therefore, the USFS and BLM can authorize, fund and carry out this action in accordance with their authority under the Forest and Rangeland Renewable Resources Planning Act (1974), as amended by the National Forest Management Act (1976) and its implementing regulations. The COE can permit this action in accordance with their authority under section 404 of the CWA (33 U.S.C. 1251 *et seq*). The intended users are Regions 1 and 4 of the USFS, the Idaho State office of the BLM, the Walla Walla District of the COE, and any permittees or applicants.

Individual copies were provided to the above-listed entities. This consultation will be posted on the NMFS Northwest Region website (<http://www.nwr.noaa.gov>). The format and naming adheres to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 *et seq.*, and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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Appendix A - PRE-Project Checklist

PRE-Project Checklist

Complete checklist prior to implementation and submit to NMFS and FWS at Level I meetings and if requesting Section 404 permit coverage, to USACOE. Use one checklist crossing.
Provide the following attachments: NEPA documentation, map, and photos of existing crossing, and document if any are not applicable.

Administrative unit	
Subbasin Name and Number (Table 4)	
Project Name:	
Stream Name:	
Activity category (Section II.A)	
Width and slope of existing structure	
Bankfull width and slope of channel	
width and slope of proposed structure	
Anticipated date of implementation	
Pre-project fish passage (red/green/gray)	
Bull trout spawning and rearing (Yes/No)	
Bull Trout Recovery Unit and Core Area (Apdx. A)	
Chinook, steelhead population (Appendix A)	
Anticipated adverse effects to listed species (Y/N)	
If 'Yes,' provide brief explanation:	
Design Team members	Additional Team members, if necessary
Fisheries Biologist:	
Wildlife Biologist:	
Hydrologist:	
Engineer:	

ESA-listed Species within Project Area (check those that apply):

Species	✓	Species/Critical Habitat	✓
Grizzly Bear		Bull trout	
Canada lynx		Critical habitat	
Northern Idaho ground squirrel		Steelhead	
Yellow-billed cuckoo		Critical habitat	
Columbia spotted frog		Sockeye salmon	
McFarlane's four-o'clock		Critical habitat	
Spalding's catchfly		Spring/summer Chinook salmon	
Water howellia		Critical habitat	
Slickspot peppergrass		Fall Chinook salmon	
		Critical habitat	

NMFS Tracking # _____ USFWS Tracking # _____

Appendix B - POST-Project Checklist

POST-Project Checklist

Complete checklist within one year of project implementation and submit to NMFS and FWS at Level 1 Meeting. Use one checklist/crossing. Provide the following attachments: photos of new crossing and pre-project checklist.

Administrative unit	
Subbasin Name and Number (Table 4)	
Project Name	
Stream Name	
Date of implementation	
Date of review	
Width and slope of new structure	
Length of upstream habitat opened for passage	
Post-project fish passage (red/green/gray)	
Turbidity monitored during implementation (Yes/No)	
Excessive erosion observed as a result of project (Yes/No)	
If 'Yes,' provide brief explanation	
Headcutting observed above new crossing (Yes/No)	
If 'Yes,' provide brief explanation	
Is there effective substrate retention or recruitment (Y/N)	
If 'No,' provide brief explanation	
Method of fish collection during dewatering operations	
Area dewatered during implementation	
Number, species, and life stage of ESA-listed fish <i>handled</i>	
Number, species, and life stage of ESA-listed fish <i>injured</i>	
Number, species, and life stage of ESA-listed fish <i>killed</i>	

NMFS Tracking # _____ USFWS Tracking # _____

Appendix C

Stream Crossing Replacement and or Removal

Programmatic Consultation

Conservation Measures Applicable to Programmatic Activities

This summary list of conservation measures is a direct copy of 'mitigation measures' presented in the BA.

F1. Buffers

F2. Low-water Work Windows

F3. Fish Avoidance

F4. Pollution Control Measures

- a. Clean Water Act
- b. Spill Prevention, Containment, and Reporting
- c. Minimize Exposure to Heavy Equipment Fuel/Oil Leakage

F5. Aquatic Invasive Control Measures

F6. Erosion Control Measures

- a. Minimize Site Preparation Impacts
- b. Minimize Earthmoving-related Erosion
- c. Minimize Temporary Stream Crossing Sedimentation
- d. Minimize Sedimentation through Dewatering
- e. Flow Re-introduction
- f. Site Rehabilitation

F1. Buffers. The Project Design Team (PDT) will recommend site-specific riparian buffers for specific activities to avoid delivery of sediment or contaminants to streams (see F4, F5, and F6). The PDT may designate buffers of different widths for different activities such as site preparation, equipment work areas, equipment staging areas, equipment fueling and maintenance areas, earthmoving, and stockpile areas. These widths may vary due to presence of occupied or unoccupied habitat, perennial or intermittent channels, floodplain width, riparian characteristics, size of stream, depth of stream valley, and other site-specific characteristics. For administrative units still within PACFISH/INFISH direction, all equipment fueling, maintenance, and staging areas will be outside of riparian habitat conservation areas (RHCAs) unless no other option is available. When no option is available, the PDT will consult with Level 1 Teams to identify adequate avoidance and minimization measures for the site.

F2. Low-water Work Windows. All projects will be conducted during low flow conditions, which typically occur from late summer through fall (specific low flow periods will be determined by a hydrologist). The State of Idaho stream alteration permit will provide in-channel work window suggestions to avoid adverse effects to ESA-listed fish species for specific locations. All projects will be completed within one work season.

F3. Fish Avoidance. A fish biologist or designee will conduct all of the following fish survey evaluations and work area clearing operations. Once those evaluations are completed it is not necessary for a fish biologist to be on site during all project actions. A fish biologist will direct or conduct a planning survey of the project stream during project planning to determine if ESA-listed fish species inhabit the project area. If the stream is intermittent, the planning survey will be conducted when water is in the channel. If the project stream in the general vicinity of the project site is found to be occupied by ESA-listed fish species or is within 600 feet upstream of occupied habitat, instream work should be conducted only during low flows and/or within the recommended in-channel work windows identified in stream alteration permits, using all fish avoidance and other mitigation measures listed below.

If the stream in the general vicinity of the project site is found to be occupied by ESA-listed fish species, a fish biologist or designee will conduct a pre-work survey of the project site again, immediately prior to any instream work. Should migrating adults, spawning listed fish, or their redds be observed within the area that would be directly mechanically disturbed or disrupted by project actions or 600 feet downstream, the project does not fit within these programmatic biological assessment (BA) guidelines (see section II.D: Excluded Projects). The PDT will coordinate with the Level 1 Team on a recommended course of action, which could include initiation of site-specific consultation. This potential delay will be built into contract language for instream project activities.

During the pre-work survey, should non-spawning, non-migrating listed fish be observed within the area (or 600 feet downstream) that would be directly mechanically disturbed or disrupted by project actions, the PDT will determine whether passive movement of fish can be achieved by slow dewatering, or whether less passive methods to clear the project site of fish should be used. Passive movement of fish can usually be achieved by slow dewatering in steeper channels, and less passive methods are rarely used in culvert projects on the Payette National Forest (Dave

Burns, retired Payette National Forest fisheries Biologist, McCall, Idaho, personal communication). Should less passive methods be warranted, a fish biologist will attempt to clear the area of fish before the site is dewatered and the flow is bypassed. This could be accomplished by a variety of methods, including seining, dipping, or electroshocking, depending on specific site conditions. Under normal conditions, block nets will be installed, fish will be captured and relocated, streamflow will be diverted around the project area, and block nets will be removed all in the same day. On very rare occasions, block nets may remain in the stream overnight when the fish capture and diversion activities require additional time to complete. All handling of fish, using any method, will be conducted by or under the direction of a fisheries biologist, using methods directed by the following:

- National Marine Fisheries Service (NMFS) Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (NMFS 2000)
- NMFS steelhead collection permits (if applicable)
- Idaho Department of Fish and Game Scientific Collection Permit (or Nevada equivalent)

F4. Pollution Control Measures

a. Follow State Water Quality Guidelines (Clean Water Act). Project actions will follow all provisions of the Clean Water Act (CWA) and provisions for maintenance of water quality standards as described by Idaho Department of Environmental Quality (IDEQ) (or its Nevada equivalent). Programmatic projects will be in compliance with all applicable state and Federal laws and processes (e.g., Section 404 permits). The PDT engineers and/or hydrologists will summarize specific pertinent guidelines for each project.

The CWA requires States to set water quality standards sufficient to protect designated and existing beneficial uses. In Idaho, "Sediment shall not exceed quantities.....which impair designated beneficial uses. Determinations of impairment shall be based on water quality monitoring and surveillance and the information utilized as described in Section 350" (Idaho Administrative Procedures Act (IDAPA) 58.01.02 .200.08). In Idaho State Water Quality Standards for Aquatic Life (Section 250), "Turbidity shall not exceed background turbidity by more than 50 nephelometric turbidity units (NTUs) instantaneously (at any point in time) (IDAPA Idaho Code 58.01.02.350.01.a). In Section 350 (Rules Governing Nonpoint Source Activities), "Best management practices should be designed, implemented, and maintained to provide full protection or maintenance of beneficial uses. Violations of water quality standards which occur in spite of implementation of best management practices will not be subject to enforcement action. However, if subsequent water quality monitoring and surveillance indicate water quality standards are not met due to nonpoint source impacts , even with the use of current best management practices, the practices will be evaluated and modified as necessary by the appropriate agencies in accordance with the provisions of the Administrative Procedures Act" (IDAPA 58.01.02.350.01.a).

b. Spill Prevention, Containment, and Reporting. All vehicles carrying fuel will have specific equipment and materials needed to contain or clean up any incidental spills at the project site. Equipment and materials will be specific to each project site, and can include spill kits appropriately sized for specific quantities of fuel, shovels, absorbent pads, straw bales, containment structures and liners, and/or booms. Storing and refueling areas will be located in staging areas away from streams in areas where a spill would not have the potential to reach live water. Containment structures may be necessary if prevention of spilled material from reaching live water cannot be assured. All pumps and generators used within PACFISH/INFISH RHCAs (for administrative units operating within PACFISH/INFISH direction), or riparian conservation area equivalents (for administrative units within the SWIEG), will have appropriate spill containment structures and/or absorbent pads in place during use.

Should quantities of stored fuel for a project exceed 660 gallons in a single tank; or exceed 1,320 gallons for all storage combined; contractors and agency operators will be required to have a standard Environmental Protection Agency (EPA) written Spill Prevention Control and Containment (SPCC) Plan onsite, which describes measures to prevent or reduce impacts from potential spills (from fuel, hydraulic fluid, etc.) (40 CFR 112, Oil Pollution Act relating to SPCC Plans).

For all culvert projects which involve fuel storage and refueling actions conducted under this BA, a written spill plan is required. This spill plan shall be developed, recommended and/or approved by the PDT (or members thereof). The plan will contain a description of the specific hazardous materials, procedures, and spill containment that will be used, including inventory, storage, and handling.

Federal and Idaho state regulations regarding spills will be followed: Any spills resulting in a detectable sheen on water shall be reported to the EPA National Response Center (1-800-424-8802). Any spills over 25 gallons will be reported to the IDEQ (1-800-632-800) (or Nevada equivalent), and cleanup will be initiated within 24 hours of the spill.

c. Minimize Exposure to Heavy Equipment Fuel/Oil Leakage. Methods to minimize fuel/oil leakage from construction equipment into the stream channel include the following:

- i.* All equipment used for instream work will be cleaned of external oil, grease, dirt and mud, and leaks repaired, prior to arriving at the project site. All equipment will be inspected by the Contracting Officer's Representative before unloading at site. Any leaks or accumulations of grease will be corrected before entering streams or areas that drain directly to streams or wetlands.
- ii.* Equipment used for instream or riparian work (including chainsaws and other hand power tools) will be fueled and serviced in an established staging area (site specifically

recommended by PDT). When not in use, vehicles will be stored in the designated staging area. The staging area should be in an area that will not deliver fuel, oil, etc. to streams.

iii. Oil-absorbing floating booms, and other equipment such as pads and absorbent “peanuts” appropriate for the size of the stream, will be available on-site during all phases of construction. For very small streams with few pools or slack water, booms may not be effective. More pads and straw bales to anchor booms may be necessary. Booms will be placed in a location that facilitates an immediate response to potential petroleum leakage.

F5. Aquatic Invasive Control Measures. Many streams have invasive aquatic species such as the New Zealand Mudsail and Whirling Disease. Many of these species are practically invisible to the naked eye and impossible to detect if attached to heavy equipment. To ensure that equipment is not contaminated, any visible plants, mud, and dirt will be removed by washing any equipment likely to come into contact with water offsite, well away from streams. Equipment will be dried thoroughly after decontamination.

Programmatic projects that would facilitate brook trout expansion into occupied bull trout habitat will not be included under this BA. Projects in streams known or suspected to contain non-native, invasive, competitive fish species (*e.g.*, brook trout) that would not facilitate brook trout expansion into occupied bull trout habitat, will require evaluation by the PDT during project planning. The PDTs will discuss individual situations with Level 1 Teams. Discussions between the two teams will evaluate the applicability of individual projects in conforming to this BA at that time.

F6. Erosion Control Measures

a. Minimize Site Preparation Impacts

i. Site clearing, staging areas, access routes, and stockpile areas will be recommended by the PDT in a manner that minimizes overall disturbance, minimizes disturbance to riparian vegetation, and that precludes erosion into stream channels.

ii. If trees need to be removed to facilitate culvert or bridge placement, they will be stockpiled for use in-channel rehabilitation.

iii. When the PDT recommends that sediment barriers are necessary, barriers will be placed around potentially disturbed sites to prevent sediment from entering a stream directly or indirectly, including by way of roads and ditches.

iv. A supply of erosion control materials (*e.g.* silt fence and straw bales) will be kept on hand to respond to sediment emergencies. Sterile straw or certified “weed free” straw will be used to prevent introduction of noxious weeds.

b. Minimize Earthmoving-Related Erosion

i. Additional sediment or erosion control barriers (additional to those recommended above, in Section F6.a.iii.) may be recommended by the PDT once construction commences. These could include Sedimat, straw bale retentions, and off-channel sediment settling ponds. In-channel sediment abatement barriers will capture sediment that is liberated during rewatering of dewatered channels, barriers will be removed, and captured sediment will be disposed of so it is not reintroduced into stream channels. Such barriers will be maintained throughout the related construction and removed only when construction is complete and erosion control is assured.

ii. Instream rocks or bedrock within occupied habitat should be broken without blasting, using non-explosive alternatives such as Betonamit (www.betonamit.co.za/). This noiseless, shock-free, non-toxic product is poured into pre-drilled holes and after a few hours exerts tremendous expansive pressure such that even the hardest rock will be broken into smaller more manageable pieces. This alternative has been analyzed and approved in other programmatic consultations within the analysis area (USDA FS and USDI BLM 2003).

However, it may be impossible in advance to determine if impenetrable rock, resistant to non-explosive alternatives, will be encountered within necessary excavation depths in occupied habitat. Impenetrable rock may only be discovered after onsite excavation actually begins, and may be resistant to non-explosive alternatives. Should this be the case, instream explosive blasting within occupied (but dewatered) habitat is covered by the proposed action, with the following mitigations. Blasting will occur in dewatered or dry channels only, and only outside of the following buffer restrictions, which are based on the weight of explosive charge. The following buffer restrictions, which apply to single shots of a given weight of explosive or single shots in a multiple charge if each shot is separated by an eight millisecond or longer delay, have been analyzed (Wright and Hopky 1998) and determined to protect fish from both swimbladder effects and egg disturbances, and have been approved in other programmatic consultations within the analysis area (see BA Effects Section VI.B.) (USDA FS and USDI BLM 2003). Buffer widths apply to the distance between the blasting activity and the nearest occupied stream bypass entrance or exit.

According to the buffers, a charge of 2.0 pounds requires an 80 foot buffer, which would ensure that effects do not extend outside of the dewatered section of channel (average 175 feet). Assuming the charge would be located in the middle of the dewatered area, effects would not be anticipated beyond 80 feet on either side of the charge, therefore effects would remain within the dewatered area. This BA does not cover the extension of the dewatered area for the sole purpose of increasing the available buffer in order to accommodate larger charge weights. If a larger charge and therefore longer dewatered area is needed to complete the action, or if explosives are necessary within the buffers, the Level 1 Team will be consulted on a recommended course of action.

Buffers for use of explosives in unoccupied habitats in perennial and intermittent channels in occupied watersheds. From USDA FS and USDI BLM 2003.

Explosive Charge Weight (pounds)	Distance From Stream Necessary to Protect Fish from Swimbladder Effects and Egg Disturbances (feet)
0.5	30
1.0	50
2.0	80
5.0	120
10.0	170
25.0	270
100.0	530
500.0	1,180

- iii.* The PDT will delineate construction impact areas on project plans. Work will be confined to the minimum area necessary to complete the project.
- iv.* A supply of erosion control materials (*e.g.*, silt fence and straw bales) will be used to respond to sediment emergencies. Sterile straw or “weed free” certified straw hales will be used to prevent introduction of noxious weeds.
- v.* All project operations will cease, except efforts to minimize storm or high flow erosion, under precipitation and high flow conditions that result in uncontrollable erosion in the construction area.
- vi.* Native streambed materials may be conserved and stockpiled above the bankfull elevation for later use in-channel rehabilitation and filling culverts. To prevent contamination from fine soils, these materials will be kept separate from other stockpiled material which is not native to the streambed. If a bridge or arch is being constructed, there may be no need to newly disturb native materials.

c. Minimize Temporary Stream Crossing Sedimentation

- i.* Stream channels in occupied habitat will be dewatered prior to heavy equipment operating within project sites.
- ii.* Existing roadways or travel paths will be used to access or cross streams whenever reasonable.
- iii.* In unoccupied habitats only, equipment will only enter the flowing water portion of the stream channel at designated temporary stream crossings (recommended by an aquatic specialist from the PDT).

- iv.* Temporary crossings will not increase risks of channel re-routing due to high water conditions (unoccupied habitats only).
- v.* Temporary crossings shall be minimized and conducted at right angles to the main channel where possible (unoccupied habitats only).
- vi.* Should the PDT determine during planning that the stream bottom needs further protection from channel disturbance and subsequent temporary sediment, temporary stream crossing structures such as rubber mats or temporary bridges may be implemented.

d. Minimize Sedimentation through Dewatering

- i.* In-channel project sites will be dewatered and completely bypassed prior to excavation.
- ii.* Any water intake structure (pump) authorized under this proposed action will have a fish screen installed, operated and maintained in accordance with NMFS fish screen criteria (NMFS 2011a)
- iii.* Flow will be diverted with pumps or structures such as cofferdams, constructed of non-erodible material, such as sandbags, bladder bags, or other means that divert water. Diversion dams will not be constructed with material mined from the stream or floodplain.
- iv.* The temporary bypass system may be constructed with non-erodible material, such as a pipe or a plastic-lined channel, both of which will be sized to accommodate the predicted peak flow rate (including possible storm intensities) during construction. In cases of channel rerouting, water may be diverted to one side of the existing channel.
- v.* Flow will be dissipated at the outfall of the bypass system to diffuse erosive energy. The outflow will be placed in an area that minimizes or prevents damage to riparian vegetation. If the diversion inlet is not screened (to allow for downstream passage of fish), the diversion outlet will be placed in a location that facilitates safe reentry of fish into the stream channel (a fish biologist will oversee these measures).
- vi.* When necessary, water from the dewatered work area will either be pumped to a temporary storage and treatment site, or into upland areas, to allow subsequent filtration through vegetation prior to water reentering the stream channel.

e. Flow Reintroduction

- i.* In perennial channels, the reconstructed stream channel will be “pre-washed” into a reach equipped with sediment capture devices such as Sedimat, prior to reintroduction of flow to the stream.

ii. In perennial streams, the construction site will be rewatered slowly to prevent loss of surface water downstream as the construction site streambed absorbs water and to minimize a sudden increase in turbidity.

iii. In-channel sediment abatement barriers such as Sedimat will capture sediment that is liberated during rewatering of dewatered channels, barriers will be appropriately cleaned out and removed, and captured sediment will be disposed of so it is not reintroduced into stream channels. Such barriers shall be maintained throughout the related construction and removed only when construction is complete and erosion control is assured.

f. Site Rehabilitation

i. Upon project completion, project-related waste will be removed. Rehabilitation of all disturbed areas will be conducted in a manner that results in conditions similar to pre-work conditions through spreading of stockpiled materials (large woody debris), seeding, and/or planting with native seed mixes or plants. If native stock is not available, soil-stabilizing vegetation (seed or plants) will be used that does not lead to propagation of exotic species.

ii. For culvert removal or bridge projects, the stream channel cross-section and gradient will be reconstructed within the area formerly occupied by a culvert in a manner that reflects more natural conditions found upstream and downstream. Large wood and/or boulders may be placed in the reconstructed stream channel and floodplain (with approval by the PDT) (See Opinion Section 1.2.2, Design Parameters).

iii. No herbicide application will occur as part of the permitted action.

iv. When deemed necessary by the PDT or aquatic specialist, compacted access roads, staging areas, and stockpile areas will be mechanically loosened

v. Trees will be retained at project sites wherever possible. Instream or floodplain rehabilitation materials such as large wood and boulders will mimic as much as possible those found in the project vicinity. Such materials may be salvaged from the project site or hauled in from offsite but cannot be taken from streams, wetlands, or other sensitive areas (See Opinion Section 1.2.2, Design Parameters).

vi. Trees (greater than 8 inches diameter at breast height) will not be felled in the riparian area for site rehabilitation purposes unless necessary for safety. If necessary for safety, trees may be felled toward the stream and left in place or placed in the stream channel or floodplain when recommended by the PDT.

vii. Site rehabilitation activities (with the exception of further years' seeding and revegetation) will be completed prior to the end of the current field season.